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THE REGISTERED MEDICAL TECHNOLOGIST: HER POSITION IN THE PHYSICIAN'S OFFICE

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Medical knowledge has progressed rapidly in the past fifty years with the discovery of the antibiotics, the use of blood and its products, and new and more radical procedures in surgery. These new approaches in therapy have brought with them the demand for broader methods of diagnosis based on a greater variety of laboratory tests for their administration and control. In the early days, the physician was expected to perform all the necessary laboratory tests himself,[1] which soon became an impossible feat. With the rapid evolution of medicine into specialized fields, the Registry was organized in 1928, by the American Society of Clinical Pathologists.[2] By this time it was apparent that trained personnel were needed to perform these complicated and time-consuming procedures so eventually accredited training schools were established, the Registry of Medical Technologists came into being, and the American Society of Medical Technologists was founded.[1] These steps in many cases solved the technical problem for the hospital and the hospitalized patient, but they still left the private physician to care for the necessary laboratory tests within his own practice. By including a registered technologist among his office personnel the physician was quick to discover that accurate tests could be performed rapidly to the benefit of his patients and himself. It is often of prime importance for the physician to have laboratory results available immediately before prescribing certain medications and to be able to follow the action of these drugs constantly during their administration. Not only is it a greater convenience for the physician to have these tests performed in his office, but it reflects credit on him for employing trained qualified persons to care for his patients[3] and it also lessens the financial burden for the patients since in many instances no fee is charged.

The technician will find the greatest volume and variety in the office laboratory of an internist or a general practitioner, although there is a place and a need for her in the office of any practicing physician. She is qualified by virtue of her training not only to perform the necessary laboratory tests, but with her knowledge of medicine, treatment and handling of patients, she is a valuable assistant to the physician. The goal of all medicine today is better care for the patient and the availability of a technician for routine procedures in the office is a step in that direction. A blood count or urine examination done while the patient is in the office can mean the beginning of necessary treatment at once. On the other hand should the patient be sent to the nearest hospital or laboratory some time may elapse before a report is received and treatment started.[3]

Certain tests, such as the basal metabolic rate, are especially well suited to office practice because many patients prefer to avoid hospitals even for such simple procedures. They sometimes have to travel a considerable distance to the hospital, and being emotionally upset when they arrive, are far from being in a basal condition. If, however, they are to come only a short distance from their home to a familiar place they are often in a more receptive mood and hence in many instances a better and more accurate test is obtained.[4] The electrocardiograph is even better suited to the office. Many cardiac patients are unable to leave their homes for this test and yet its performance is vital for their correct treatment. Few hospitals have a service that provides for conducting this test in the home, but for the physician with a technician and machine, it is a simple matter. The personal relationship between the patient, physician and technician is an added factor toward obtaining a good tracing and yet not alarming the cardiac patient who is in most cases very apprehensive. The reaction that many patients have is surprising when a strange person advances on them and attaches them to a machine in such a manner that it appears as if they were going to be electrocuted.[5] These are just two examples of simple tests which save both the patient and the physician valuable time in diagnosis and the starting of therapy and can be performed routinely in the office with a minimum amount of equipment.

Naturally there are many examinations, such as bacteriological cultures and many chemical tests, which because of equipment, complexity or infrequent demand are not adaptable to the small office laboratory. They can be performed more easily and with greater accuracy in a hospital laboratory that is doing many such tests each day. The average physician's office laboratory is mainly to serve the physician and the patient with prompt,

accessible and accurate tests of a necessary but limited type, In no way does it take the place of the diagnostic facilities of the modern hospital laboratory.

The office technician becomes much more careful and thrifty in the use of such things as film, gauze, slides and solutions than do her sister technicians because extravagance and waste become noticable more quickly to the average physician than to a pathologist or hospital administrator who is accustomed to a large expenditure by the laboratory. The office technician should be mechanically inclined, for she should be able to keep her equipment in correct running order and to make repairs of a minor nature. Such things as changing film and fuses in the electrocardiogram and cleaning and adjusting the basal metabolism machine are simple everyday procedures and can save valuable time during periods when it would be most inconvenient to have these appliances out of order or in the factory. She must be capable of taking responsibility, be able to improvise with what equipment and knowledge she has and adapt herself to any situation that may arise. In many cases the technician must obtain not only specimens for tests to be performed in the office but she must also collect samples to be transported to the hospital laboratory. This is another convenience for patients, particularly when they are confined to their homes or must travel a distance to the hospital laboratory. This service requires the technician to know the type of specimen needed; for example, whether it should be oxalated or whole blood that the particular laboratory employs for the correct performance of the test and, when oxalate is indicated, that the proper type be used.

There are two sides to every question, hence there are many advantages for the technician employed in the office and there are a few disadvantages. There is a great opportunity to learn a side of medicine which the hospital technician lacks. This is the opportunity to learn about therapy, diagnosis and medication. To the hospital technician each patient becomes familiar by virtue of some condition, operation or specimen. She sees the patients only when they are ill. In the office the technician has the opportunity to know the patients as individuals and to become interested in them personally as well as familiar with their laboratory aspects. There is also the advantage of following them through their therapy with the physician and of observing how the results of the tests performed indicate the treatment.[6] In some cases even the technician's advice is sought on the best test to perform in order to establish the diagnosis. Often many latent talents are awakened in the technician when it becomes necessary to assist in the other routine duties in a physician's office. For example a knowledge of typing and bookkeeping make her an even more valuable asset to her employer.

The registered technologist always has the opportunity to publicize the profession and educate the public. It is an extraordinary fact, relatively speaking, that many more private physicians and clinics require their technologists to be registered than is the case with hospitals. According to the Women's Bureau of the Department of Labor out of 16,672 replies to a survey conducted among technicians, 83 percent reported that the offices and clinics where they were employed required them to be registered, whereas only 7 percent of the others employed in hospitals reported that registration was required of them.[7] If the technologist wears her Registry patch or pin, the patients may ask its significance and in that manner the public may eventually expect to have registered technologists perform tests on them just as they have learned to expect registered nurses to care for them. It is often possible for the technologist to interest young patients in her profession and to help direct them to the proper schools which will enable them to become registered technologists.

The disadvantages of working in an office are few, the main ones being that the variety of tests employed is limited and that there is little opportunity for advancement in either position or salary. Ultimately one finds that many of the techniques common to the hospital laboratory are forgotten, but by remaining conversant with the current literature and attending technical society meetings, she is able to keep pace with the hospital worker. In most large cities there are schools which give various technical courses throughout the year and attendance at one or more of these annually keep the technician well informed on techniques that she might miss in the office. Another disadvantage is the lack of exchange of ideas and opinions that is common in the hospital laboratory. There one can always obtain someone else's advice and opinion and in that way start an instructive discussion. The best solution to this problem is to keep an up-to-date reference library and when recourse to this fails, to take one's troubles to the hospital and consult with the pathologist and the technologists.

The laboratory itself can be just as large or as small as space and money permit and necessity demands. With hospital and private laboratories being the magnificent places with all of the latest equipment and facilities that so many of them are today, the office laboratory seems very humble by comparison. Some office laboratories are spacious and some are very small, but even a small laboratory which has utilized its space to contain only the necessary equipment for the day's work is far better than none at all. Any room that is accessible to the waiting room and to the physician's office and is equipped with running water and illuminating gas is suitable to become the laboratory.

It would seem unnecessary to mention that the most vital piece of equipment for any office laboratory is a good microscope which has high, low and oil objectives and a mechanical stage. Calibrated pipettes and glassware of the proper type and size for the tests to be performed are used routinely. A centrifuge of sufficient capacity and capable of high speed is an item of necessity. Such things as mechanical pipette shakers, washers, and counters are extremely useful and time-saving, but they are not absolutely vital for the small laboratory. The problem of solutions and stains is an important one. Unless an analytical balance and storage space for numerous chemicals are available, it is far simpler to purchase prepared solutions and stains from a reputable pharmaceutical firm. When small quantities are desired or special solutions are needed the chemicals can be purchased and taken to a reliable prescription pharmacy where for a small charge the solution can be made.

Without going into a detailed description of the methods of performing various types of tests, but merely mentioning a few of the simpler routine types that can be done easily and accurately in the small laboratory with a minimum amount of space and equipment, a brief summary follows:

A complete blood count and urinalysis is done on all patients on their first visit. The hemoglobin is determined by using the Sahli method unless the office is fortunate enough to possess a colorimeter. By the Sahli method with the tube calibrated at 14.5 gm. equal to 100 percent there is only an error of plus and minus five percent in experienced hands. The result is reported in grams.[9]

The use of slides versus coverslips for smears is purely a personal one; smears made on coverslips are accurate, easier to handle, and can be stored more easily than slides but they are somewhat more expensive. With care they can be used many times and the broken ones are useful in doing urine microscopics.

The urinalysis is done in the routine manner. The Purdy method[9] for albumin is probably easier and cheaper than the use of nitric acid. Sugar can be detected by numerous methods, such as by the use of Benedict's solution or any of the tablet methods. The Clinitest# and Galatest* are satisfactory. When the test for sugar is positive, the presence of acetone can be detected by using the tablet method.* The results of these initial tests and the physical examination may reveal the necessity for performing more tests. The sedimentation rate is easily carried out by using any of the accepted methods, such as the Ernstene-Rourke procedure using Muller's[10] correction tables, which gives a corrected hematocrit and from this information one is able to

Effervescent Products Inc., Elkhart, Indiana.
* Denver Chemical Mfg. Co., Inc., New York, New York.

compute the cell volumes. Further blood studies can be carried out by using the Rese and Ecker method[9] for the determination of platelets and the dry method with Wright's stain for the examination of reticulocytes.[9] The examination of thick and thin smears for malaria are done in the usual manner using Giemsa stain and buffered water.[11] It is rarely necessary to type, Rh determine or cross-match an office patient unless one is in a rural area. Transfusions are not office procedures and patients entering a hospital for operation are routinely submitted to this testing. Nevertheless these tests are not contra-indicated in the office laboratory. Bleeding times are done using the Duke method and clotting times by using glass capillary tubes.[9] With the universal use of Dicumerol and its relatives, it is now no longer necessary for patients to remain months in the hospital once they have been fairly well stabilized on the drug. The prothrombin time can be done in the office using Thromboplastin* or Simplastin† by any of the more recent methods such as the Quick one-stage, the Link-Shapiro or the Tufts-Rosenfeld.[12] In some respects the prothrombin time done in the office has advantages over that done in the hospital, as it is possible to use the same control all the time and have every test performed by the same technologist.[13]

There is available a spot test for the presence of sulfonamids in urine.‡ The benzidine test for blood can be used on urine, feces, sputum, vomitus and other material. There is a simple method for determining urine chlorides as an aid in following patients on salt free diets.[9] The phenolsulphonephthalein test and any of the urine concentration tests can also be performed. It is a routine procedure to examine stools for ova and parasites.

Among the bacteriological tests, the only ones suited to the average office laboratory are the examination of direct smears such as smears for gonorrhea using Gram's stain, and in cases where the physician wishes to know whether the organism is Gram negative or positive. Wet smears for fungi and the hanging-drop method for trichomonas are useful daily as is using methylene blue for Vincent's angina. With a few more added stains it is a simple matter for the technician to perform the Ziehl-Neilson stain for tubercle bacillus. There is on the market at the present time a screening test for blood sugar with an accuracy of plus and minus five percent. This test requires only 0.2cc. of blood and will indicate whether the patient's blood sugar is within the range of 50mg. percent, 130mg. percent, 180mg. percent or above.¶

* Difco Laboratories, Detroit, Michigan.
† Chilcott Laboratories, Morris Plain, New Jersey.
‡ Sulfatest, F. E. Young & Co., Chicago, Illinois.
¶ Test Kit #7, Eli Lilly & Co., Indianapolis, Indiana.

Two of the most useful tests done in the physician's office from the physician's and patient's standpoint as previously mentioned are the basal metabolism test and the electrocardiograph. Any good make of basal machine that is easy to operate, keep clean and takes a minimum amount of time to change both lime and oxygen is adequate. The best type of electrocardiograph for general office use is the viso-cardiette or direct writing machine. It is light enough to carry into the patient's home, requires a minimum amount of time to operate but probably its greatest advantage is that it is possible, if a cardiac condition is present, for the physician to make the diagnosis at the bedside and begin treatment at once. The newest machines also have multiple lead selectors built into them which cover most of the leads used in cardiac practice today. The use of this machine eliminates the necessity for a darkroom. The tracing is simple to mount and is permanent if kept away from water.

There are at present approximately 14,000 American Society of Clinical Pathologist registered technologists in the United States. The projected demand by 1960 is for 45,000.[2] This indicates that there will have to be a concentrated recruiting program and an increase in the available training facilities if this demand is to be realized. Not only is the registered technologist needed in the hospital, but as long as medicine continues to grow and more clinical investigation becomes necessary, there will always be a demand for her in the physician's office far greater than our approved schools at the present time can supply.

Summary

The origin and necessity for well qualified—preferably registered—technologists in the office laboratory of practicing physicians is stated. Some examples of tests are given showing their suitability to the office as a necessity and convenience for the physician and patient. Certain chemical and bacteriological investigations are not suitable for office laboratory performance. A brief outline of some of the duties and requirements of an office technician and the advantages and disadvantages for her in this type of work are discussed. A summary follows of simple tests that can be performed in a small office laboratory with a minimum amount of equipment and expense without sacrificing accuracy. The need for more registered technologists in this vital field of medicine is stressed.

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THE VALUE OF SEROLOGIC TESTS FOR SYPHILIS

WILLIAM A. HINTON, M.D.*†

Serologic tests are universally used for the detection of syphilis. For this purpose I regard them of greater importance than any other single medical procedure because detection is the first essential step in the efficient control of the disease. In 1915 when the Massachusetts State Wassermann Laboratory was established a tabulation of each patient's blood which it tested showed that 55% of the syphilitics were discovered solely by means of the Wassermann test. I hazard a guess that even a larger percent are being discovered with the newer and more reliable tests, for some of them are far superior to the Wassermann reaction as performed at that time.

However, besides detection of the disease, there are other uses made of serologic tests for syphilis; some are of no value, some of little value, and some are not only worthless but may be grossly misleading. This paper will consider critically the value of the various uses of these tests and emphasize some of their limitations. But before doing this I shall give a brief description of the background which, in my opinion, has influenced

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†Read before ASMT Convention, Swampscott, Mass., June, 1951.

the interpretation of the significance of their results.

The first serologic test for syphilis was the Wassermann reaction. It was based on theories of immunology that prevailed at the beginning of the century. Indeed the serology of syphilis was regarded as a special technical application of immunological concepts to practical syphilology. When the Wassermann reaction was first devised an aqueous extract of a liver of a congenitally syphilitic infant containing the Treponema pallidum was used as antigen. According to theory the blood and spinal fluid of a person infected with syphilis contain the antibody that is specific for the Treponema pallidum. Although this antigen-antibody relationship was soon proven false, it still dominates many important conceptions concerning the nature of the disease and its treatment. As a teacher for many years I have made a strenuous effort to distinguish between the serology and the immunology of syphilis with the hope of eliminating conflicting concepts which complicate the management of the disease.

The serology of syphilis concerns itself with the reaction of blood serum, spinal fluid, and occasionally other serous fluids by tests conducted chiefly in test tubes or on slides. On the other hand, although immunological reactions may be studied with the aid of test tubes and other laboratory apparatus they are chiefly conducted by tests on animals and are designed to explain the mechanisms and the significance of natural or acquired immunity to the Treponema pallidum. During the last part of the nineteenth century Metchnikoff, Bordet, Ehrlich, and others advanced immunology and serology with brilliance and at times even with fantastic imagination. Although the immunology and serology of syphilis are generally treated as overlapping subdivisions of bacteriology, they should be regarded as separate disciplines because serologic tests for syphilis are performed with antigen which fail to produce an antibody, an essential requirement of an antigen: the only serologic reaction which seems actually to employ an immunologic principle is the Treponemal immobilization test devised by Nelson. It depends on the immobilization of Treponema pallidum by the serum of a syphilitic.

With this introduction I shall proceed to a consideration of the value of serologic tests in the diagnosis of syphilis. The proper management of syphilis depends upon the correctness of its diagnosis, and this cannot be made by serologic tests alone because in some persons other diseases actually cause a positive result. Although the imperfect specificity of the Wassermann reaction was recognized shortly after it was devised, its absolute specificity is still assumed by many physicians, some of whom are teachers in medical schools. The diagnostic infallibility of the Wassermann reaction and later serologic tests for syphilis is postulated by the fact that the tests themselves were com-

monly called serodiagnostic tests for syphilis and are still so designated by some medical writers, and some textbooks were written under the title of "Sero-diagnosis of Syphilis." Over the years there has been a growing realization that other diseases actually cause a positive reaction in a certain percent of persons even if the most accurate serologic tests are used. Consequently reliable clinicians now regard a positive serologic test as a very important *aid* in the diagnosis of syphilis but not diagnostic of itself. Despite their very high efficiency in the detection of syphilis they still pose the problem of false positives under a number of conditions not due to faulty technique. Such positives are now commonly called biologic false positives. In some cases leprosy, malaria, infectious mononucleosis, severe streptococcal infections, whether localized or generalized, virus pneumonia and even such harmless procedures as vaccinations against smallpox, produce false positive results. Moreover, many other diseases occasionally cause false positives. I have not included such Treponemal diseases as yaws, bejel, and pinta which also produce positive reactions in about the same percent of cases as syphilis does, because the causative agent of each being morphologically similar to the Treponema pallidum may be closely related to it biologically.

The value of serologic tests as an aid in the diagnosis of syphilis may be illustrated by the following facts: 39 states and 3 territories of the U. S. A. require premarital blood tests for syphilis, 41 states require prenatal blood tests for this disease. They are a part of the routine laboratory examination in practically all the hospitals and large industrial establishments in Massachusetts and some other states, and they are required tests before induction into the Armed Forces.

Before undertaking a critical consideration of the other uses for which serologic tests have been or are considered of value I wish to define syphilis and to stress some of its fundamental characteristics as a disease. The acquired form of syphilis begins in a few days after an infecting exposure as a generalized infection with the Treponema pallidum which very commonly causes *repeated* attacks of slowly evolving chronic inflammatory lesions. It is a self-limited disease in which new lesions rarely develop twenty years after infection, even though no anti-syphilitic treatment has been given. Besides the acquired form of the disease there is the congenital form which is transmitted by the mother to her offspring by the passage of the organisms from the mother's blood through the placenta into the fetus.

Next I shall consider the value of serologic tests under the following headings: 1) Determination of Infectiousness. 2) Appraisal of the Severity of the Disease in the Individual. 3) Estimation of the Effect of Treatment.

1) INFECTIOUSNESS. Serologic tests were once widely used in relation to the infectiousness of any given individual, a positive reaction indicating the capacity to transmit the disease to another person or a mother to her offspring. It is truly hard to understand why serologic tests could be used for this purpose. Infectiousness relates itself to a positive reaction only as it aids in making a correct diagnosis. Infectiousness is determined by the stage of the disease; primary, secondary and early tertiary being infectious while the tertiary syphilitic infected five years or more even if untreated rarely infects another. There is but one notable exception and it is the capacity of a mother to transmit the disease to her offspring. This capacity of transmission of congenital syphilis is relatively slight in a syphilitic mother infected more than ten years, although it may occur as long as twenty years after she has acquired the disease. The unreliability of a positive reaction as indication of infectiousness can be illustrated by the fact that in the early years of premarital blood test laws persons with a positive reaction were not permitted to marry in some states. Fortunately, it did not take very long for most of these laws to be changed, so the physician could certify the eligibility of persons to marry even if they had a positive blood test providing the physician would affirm that in his opinion the disease was not in a communicable stage as based upon the duration of the infection and the amount and character of the treatment which had been received.

Another illustration of the belief that a positive reaction is an indication of infectiousness is shown by the fact that some states and some industrial organizations will not permit persons who have a positive blood test to work as food handlers. The following is a striking example of the stupidity of this interpretation: A large dairy firm in Massachusetts required all its employees be tested serologically for syphilis. My attention was particularly called to a man whose duties were to clean the cow stalls. He had been married for twenty years and his wife and eight children all gave negative reactions. Even assuming that this man had syphilis it is inconveivable that he would not have infected members of his family if he were truly infectious. Nevertheless, it was difficult to convince the firm's physician that he could not possibly infect the milk and thereby be a means of spreading the disease to those who drank it. This man may have had a biologic false positive reaction or he may have been infected long enough before marriage so that he had not transmitted the disease to his wife and children.

2) APPRAISAL OF SEVERITY OF INFECTION OF THE DISEASE. Serologic tests of blood and spinal fluid still are used by many physicians as an aid in determining the severity of the infection and in estimating a prognosis. A 4+ reaction often written

++++ was regarded by many as indicative of a severe infection and consequently a poor prognosis. On the other hand a weakly positive reaction was often regarded lightly. Such interpretations are now known to be wrong and are so considered by more enlightened syphilologists and physicians. I can illustrate by two cases the correctness of my belief concerning the worthlessness of serologic tests in relation to the severity of an infection and its prognosis. The first was a patient 89 years old who acquired syphilis when he was 19 years of age. He had a strongly positive reaction and it is my belief I am making no mistake in assuming it had been strongly positive for at least 69 years. He lived to a really ripe old age despite this strongly positive reaction and at the time of his examination presented no evidence of spyhilitic injury. He entered the hospital for a condition wholly unrelated to syphilis. In contrast to this case there was a young woman 29 years of age who had contracted syphilis a few years previously, was given treatment for it, and as a result her blood became negative. Because of the negative reaction which persisted until her death no attention was paid to signs of syphilitic heart disease which killed her as was demonstrated by the autopsy findings. Here was a woman with fatal syphilitic heart disease who had a negative reaction which if one were to conclude from serologic tests would indicate that she had been cured and was free from syphilitic injury.

3) ESTIMATION OF THE VALUE OF THE SEROLOGIC TESTS IN RELATION TO EFFECT OF TREATMENT. In my experience many doctors treat a positive serologic reaction in a patient without due regard to the character and duration of the syphilitic injury. The chief concern of such physicians is to treat the patient with the primary object of causing the positive reaction to become negative. If the problem were as simple as this nurses and technicians would do as good a job if not a better one than many doctors. The most controversial points among syphilologists are how treatment should be given and when it should be stopped.

In order to have an accurate means of measuring the effect of treatment upon the positive serologic reaction, quantitative tests are quite generally recommended. These quantitative tests are reported by some serologists by units of positivity and by others as the highest dilution of serum which will produce a positive reaction. The physician who relies upon the quantitative test as an aid in estimating the effect of treatment should reason somewhat as follows: If an individual had 640 positive units at the beginning of treatment it would be reasonable to conclude that when his blood had 320 units the patient would be half cured and when his blood showed zero units he would be completely cured. In other words, treatment had been successful and its

effect upon the patient was quantitatively indicated by the figures which I have given. No such conclusion can be made because when his blood has decreased from 640 units to 320 units the infection may again manifest itself in an active form, commonly demonstrated by new lesions and an increase in the number of positive units. Furthermore, the disease may break out again and the number of positive units may increase even after his blood has become negative as a result of treatment. Consequently, one cannot draw *reliable* conclusions, that is conclusions upon which one can depend, from quantitative tests of the blood in relation to the effect treatment or, for that matter, conclude that a negative quantitative test means cure. The strongest proof which I can give as to the truth of my belief in the very limited value of quantitative tests is this simple statement: that if the obtaining of a negative test as a result of treatment means the disease is cured there would be no need of requiring the patient to be followed serologically and clinically for three to five years after he has attained a negative reaction, but prolonged follow-up is practiced by syphilologists the world over on patients whose blood has become negative as a result of treatment. Moreover, in a contrary way, there are two other groups of cases which strikingly illustrate the lack of reliability of serologic tests in regard to treatment. These are congenital syphilitics who have had the disease for a number of years and persons who have had acquired syphilis for many years. These two groups of patients may continue to give a positive reaction for an indefinite period despite the fact that their syphilis has been cured by a combination of treatment and time. I recall a patient who was treated for congenital syphilis in a children's hospital until she became 12 years old at which time she was transferred to a general hospital because the children's hospital did not treat patients over 12. The patient's treatment on the basis of the duration of positive tests was continued until she was 26 years of age. In over 99% of the cases this is five years after spontaneous cure has taken place.

Before concluding I wish to give you my experience with a psychiatric hospital where patients were treated for one of the severest forms of tertiary syphilis, general paresis. It was my custom to telephone from time to time about certain patients who were being treated over a long period of time. The irrelevance of a positive serologic test either qualitative or quantitative was shown by the answers I would get in relation to some of the patients. For example; Mr. A. had a very strongly positive reaction when antisyphilitic treatment for his central nervous system syphilis was first begun. After he had been treated for five or six months I inquired as to his condition and was told he was improving and that his spinal fluid showed a much weaker reaction. Upon still further inquiry after additional treatment I was told that improvement was continuing because his reaction had gotten progressively weaker. I

called again about two years later and was told that the patient had died. Here as you will see a patient died despite an improving serologic test of his spinal fluid. On the other hand a number of patients who had strongly positive reactions which were not changed by prolonged treatment returned to their former occupations which they were able to discharge as efficiently as they did before syphilis had injured their brain. The only conclusion one can get from such cases is that a persistently strongly positive reaction does not necessarily forecast a bad prognosis.

Summary

Serologic tests for syphilis are the most effective means of detecting the disease. They are valueless in: 1) determining the infectiousness of the disease, 2) in appraising the severity of the infection, and 3) they are unreliable in estimating the effect of treatment in such a large number of cases that in individual patients no dependence can be placed on them either in forecasting prognosis or determining cure.

THE DEPENDENCE OF THE PHYSICIAN UPON THE LABORATORY IN THE MANAGEMENT OF THE DISEASE DIABETES MELLITUS*

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Without the medical technologist and the chemical laboratory, physicians could not diagnose the disease, diabetes, regulate its treatment, recognize or correct its crises or prevent its complications. Present day concepts of these problems is the subject of this discussion.

Diagnosis of Diabetes

Although criteria for the diagnoses of diabetes are uniform, diagnostic levels for blood sugar, the choice of method for determining glycemia, and superiority of true glucose over total reducing substance are controversial matters. At the Joslin Clinic, the diagnosis of diabetes is established when hyperglycemia and glycosuria are demonstrated. The diagnostic level for blood sugar, using the Folin-Wu method is 130 mg. fasting or 170 mg. for post prandial bloods (taken within 2 hours of food). If capillary blood is determined, the diagnostic post prandial value is 200 mg. using the Folin-Malmros method. Within the year, however,

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determinations for true glucose may be substituted for our present tests.

The importance of an accurate diagnosis of diabetes today cannot be overemphasized. The researches of physiologists and of pathologists have shown that in experimental diabetes the diabetic process can be reversed providing therapeutic measures which lower blood sugar are instituted within three months of the onset of diabetes.

Mass screening of the population has been advocated partly to reveal the total diabetic population but mostly to identify and thereby protect the individual who has the latent and therefore reversable form of the disease.

The Wilkerson-Heffernan kit and the Houston Clinitron were designed to screen the population for these latent cases. From countrywide surveys we have learned that for each known diabetic there is one unkonwn one—most often found among relatives of other diabetics. The total incidence of diabetes in the United States as a result of these surveys is now placed at 2,000,000 cases.

Not only is it important to reveal diabetes when it exists but it is equally important to rule out benign glycosurias and melliturias other than glucose. Transitory glycosuria without hyperglycemia, and permanent glycosuria without hyperglycemia are equally benign, as are most of the non-glucose melliturias such as those produced by pentose, levulose, sucrose and lactose.

Regulation of Treatment

When insulin was discovered in 1922, students of diabetes surmized that the problems of the diabetic were solved and that the prognosis of the disease was good for a long and comfortable life. By 1930 the optimism was beginning to wane. By 1940, pessimism replaced optimism, but by 1950 optimism returned. The cause and effect relationship between diabetes and its complications had become clarified. Ketoacidosis, damage to nerve tissue, damage to blood vessels, and loss of resistance to infections resulted from chemically uncontrolled diabetes.

To protect the patient from the ravages of the disease, physicians must have frequent laboratory tests. This includes as essential for hospitalized patients, 24 hour quantitative determinations for glucose, qualitative tests for acetone in the urine, fractional qualitative test for sugar at 7:30 a.m., 11:30 a.m., 4:30 p.m., and 10:00 p.m., and determinations for blood sugars at corresponding hours.

Regulation of the dose of insulin as well as the choice of insulin depends upon these levels. Thus the results of 7:30 a.m. tests guide in the regulation of protamine zinc insulin, globin

insulin and NPH insulins; the 11:30 a.m. tests guide in the regulation of crystalline or regular insulins; and the 4:30 p.m. and 10:00 p.m. tests guide in the regulations of NPH or globin insulins.

Partition of the diet, too, depends upon these determinations.

Diabetic Crises

Hypoglycemia. The diagnosis of hypoglycemia may be suspected by the history and by the physical examination of the patient, but must often be confirmed by the determination for sugar in the blood. Cerebral accidents, epileptiform seizures, eclampsia, drug poisoning may all resemble the clinical picture of hypoglycemia. The diagnostic level of blood sugar which confirms the diagnosis is 60 mg. or below.

Ketoacidosis. In the diagnosis and treatment of ketoacidosis the physician is absolutely dependent upon the laboratory. The level of carbon dioxide content of the blood used to establish the diagnosis of coma in the Joslin Clinic is 9 milliequivalents or 20 volumes per cent. Therapy with insulin depends more upon the height of the blood sugar. Our schedule is as follows: under 500 mg.—250 units of insulin, 500 to 1000 mg.—500 to 1000 units of insulin, and 1000 mg. and above—over 1000 units of insulin.

Loss of potassium can cause death in the patient with ketoacidosis even when carbohydrate metabolism is corrected. We have depended upon the laboratory for determinations for potassium. Levels may be elevated at first and then fall below 4.5 milliequivalents a few hours after the inauguration of insulin treatment. If flame photometers are not available, the need for potassium therapy may be revealed by changes in the electrocardiogram such as lowering of T waves and prolongation of the QT interval.

Complications of Diabetes

In the recognition and treatment of the complications of diabetes, the laboratory is indispensable.

Infections of the skin and bone are due most often to the staphylococcus, therefore bacteriological examinations are not vital. They are vital, however, in the treatment of urinary tract infections. Minimal evidence of urinary tract infection in the diabetic should be given maximal diagnostic and therapeutic care. The serious form of vascular nephritis to be described later progresses following bouts of urinary tract infection. Careful examination of the sediment, determination of the offending organism, and sensitivity to therapeutic agents is an important part of our program for protection of the kidney of the diabetic.

Tuberculosis. The incidence of tuberculosis in the young diabetic is 20 times that of the general population. Whereas less than 10 per cent of individuals contracting tuberculosis die of that disease, 90 per cent of the diabetics who contract tuberculosis die of it. It is a

rapid fulminating and virulent disease in young diabetics. Such patients require yearly screening by X-ray for minimal lesions and then radical surgery if the diagnosis is proved by smear or culture.

Diabetic neuropathy. Nerve damage in the diabetic simulates the disease tabes. The same paralysis of the pupil, involvement of joints, of motor and sensory nerves, of the gastro-intestinal tract and of the bladder occur. The diagnosis of diabetic neuropathy is confirmed by the demonstration of an elevated protein in the cerebro-spinal fluid, namely to 60 mg. or above, and by the change in colloidal gold curve to that which is between a paretic and normal curve.

Vascular disease. The manifestations of vascular disease in the diabetic vary with control of the disease as previously stated, with its duration, and with the age at onset of diabetes. Vascular damage is evident some 12 to 15 years after the onset of diabetes. The lesions occur in the eye and kidney if the onset of diabetes has occurred in childhood or adolescence, in the heart if it has occurred between the ages of 20 and 49, in the extremities and brain if the onset occurred at an older age. Determination for capillary fragility helps predict probable retinopathy, and guides in the choice for such therapy as rutin or cortisone eye drops.

Calcification of vessels is demonstrable by X-ray using ordinary bone technique. We search for lesions in the order of their probable appearances which is as follows: foot and legs, pelvis, abdominal aorta, thoracic aorta and cerebral vessels. Gangrene, obstetrical accidents, cardiac and cerebral lesions can be suspected to be eminent if these lesions are present. Appropriate therapeutic agents such as control of weight, Buerger exercises, endocrine therapy may then be prescribed as indicated.

Serial electrocardiograms to establish the basic pattern and to reveal changes should be done at regular intervals on diabetic patients.

Nephritis. The nephritis seen in the diabetic is characterized early in the laboratory by such positive findings as proteinuria, hypercholesterolemia, low total protein with reversal of the A/G ratio. Urea clearance is impaired. The lesion is primarily glomerulae. The specific gravity, non-protein-nitrogen, phenolsulfaphthalein excretion, and urinary sediment remain normal for a long time. In the late stages of this disease, there is nitrogen retention and failure to excrete the dye.

Hepatomegaly, Dwarfism. Three complications are specific for diabetic children: failure of growth, of development, and enlargement of the liver. The correct classification of retardation of growth depends upon x-ray findings. Delay in bone age is diagnostic. The usefulness of growth promoting substances in these cases is based upon X-ray evidence of open or closed epiphyses.

Abnormally high levels for FSH, low excretion of 17-ketosteroids help to classify and guide therapy for retardation of development.

Tremendous enlargement of the liver can be demonstrated in the juvenile diabetic better by X-ray than by physical examination since the liver edge really descends into the pelvis. This enlargement is due to fatty infiltration, so liver function tests are normal.

Management of the Obstetrical Diabetic Patient

In the management of the obstetrical diabetic patient the determination of levels for sex hormones, chorionic gonadotropin, estrin and pregnandiol have clarified the cause of failure and have suggested corrective therapy. Pregnancy in the true severe diabetic is characterized by failure—high fetal mortality, and abnormal obstetrical course namely preeclampsia and hydramnios. The disturbed chemistry, the fetal fatalities and the obstetrical abnormalities are corrected and prevented by sex endocrine therapy. We actually test our patients weekly for levels of serum chorionic gonadotropin and for urinary pregnandiol excretion.

The anesthetized surgical diabetic patient can often be controlled well only if followed by frequent laboratory examinations. Is the drowsiness the result of anesthesia? Is it hypoglycemia? It is ketosis? Is it a combination of two of these? Sometimes only the laboratory can give us the answer.

During the past few years the research laboratory has answered in part or in entirety the following questions:

Why is juvenile diabetes a severer form of the disease than is the adult form? What substances cause or reverse diabetes in the experimental animal? What can cause vascular disease experimentally?

Assays of the pancreas of autopsied diabetic children show 100 per cent islet failure—no insulin can be found, whereas adult diabetics have 50 per cent as much as non-diabetics. In addition to glucose, alloxan, uric acid, pituitary g. h., ACTH, cortisone and phosphates are all diabetogenic substances. BAL, fractions of Vitamin B, glutothione and cystein give protection against these agents so that diabetes is not produced by them. Arterial disease has been produced by desoxycorticosterone, anterior pituitary extract, cholesterol and by hyperglycemia.

Finally, accurate chemical control of diabetes is so important and so difficult to achieve, that in the severest forms of diabetes in the juvenile, one of our most important parts of treatment is the summer camp. And what is the most important single unit at the summer camps? Why of course, the laboratory!

CORTISONE AND ACTH: THEIR PHYSIOLOGY AND STATUS IN CLINICAL MEDICINE*†

By FRANCIS L. COLPOYS, JR., M.D.‡
and THEODORE B. BAYLES, M.D.§

The discovery and clinical application of cortisone and ACTH constitute one of the brightest and most interesting chapters in medical history. The isolation and production of these hormones have been time consuming and difficult in comparison to the hormones of the other endocrine glands. The work on the pancreas was accomplished within a few months, and insulin was on the market within a year. The completion of the work on the parathyroid, adrenal medulla and the sex hormones involved only several years. Eighteen years, however, elapsed between the first demonstration of the physiologic activity of the adrenal cortex and the release of cortisone to clinical medicine.

Between 1930 and 1940, twenty-eight different steroids were isolated from the adrenal cortex. Only four were physiologically active, capable of maintaining life in adrenalectomized animals. These were called Compounds A, B, E and F. All four were considered capable of sustaining patients with Addison's disease but the minute amounts isolated made experimentation impossible. A half ton of adrenal glands was needed to produce one tablet of Compound A. It was noted that these four compounds had strong effects on protein and carbohydrate metabolism in the body, and slight effects on electrolyte and water chemistry.

In the early stages of work on these compounds, it was hoped that they would benefit patients with Addison's disease whose own adrenal glands were not functioning. No one anticipated, however, that they would be helpful in the many diseases in which they are used today. In World War II much hard work continued because it was felt that these hormones might also be of benefit in soldiers suffering from the shock of severe injuries or burns. At that time the National Research Council considered work on the adrenal hormones to have top priority.

Compound A was the first drug to be manufactured chemically, and this was accomplished in 1945. However, it was found to be of little use in patients with Addison's disease, a bitter disappointment to investigators and a fact which threatened to end all research work. Doctors Edward C. Kendall and L. H. Sarett persisted in their efforts to synthesize Compound E, or cortisone acetate, with eventual production of a few grams in April 1948.

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Doctor Philip S. Hench of the Mayo Clinic had for many years considered the mechanism of the sudden and complete reversibility of rheumatoid arthritis in pregnancy and jaundice. He requested cortisone for use in patients with arthritis, postulating that the use of adrenal hormones might produce similar clinical remissions. In the winter of 1948-49, sixteen patients with rheumatoid arthritis and five patients with rheumatic fever were treated with cortisone at the Mayo Clinic.[1,2] There were immediate and beneficial effects in every case.

Cortisone, or Compound E, (Figure 1) is synthesized from bile acids. The availability of cortisone is at present restricted by the limited supply of bile acids. Widespread synthesis of cortisone from more available plant sources will be possible with further research. Cortisone is a steroid substance with a chemical structure similar to many other plant and animal steroids. Its anti-rheumatic properties, however, are closely dependent on its chemical structure and substances differing only slightly are clinically ineffective. Only cortisone and Compound F, of all the steroids tried, are capable of reversing disease states. When injected or ingested into the body, cortisone acts by supplying an excess of adrenal hormone. It is independent of the functional state of the body's own endocrine system.

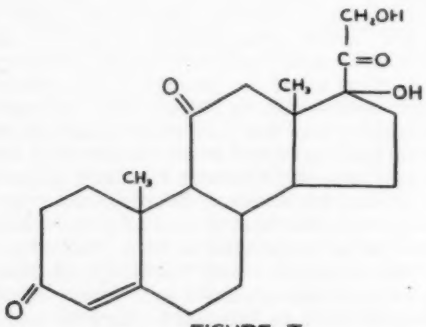

FIGURE I
CORTISONE, COMPOUND E

ACTH, or adrenocorticotrophic hormone, is an anterior pituitary hormone isolated in a pure form in 1943 by Li and his co-workers from sheep pituitaries, and by Sayers and his co-workers from swine pituitaries. Its supply is dependent upon

the quantity of swine, sheep and cattle pituitary glands obtained from slaughter houses. Research workers are attempting to break down the complex protein formula of ACTH into biologically active and clinically beneficial polypeptides which might be capable of synthesis. Soon after the production of adequate amounts of ACTH, its beneficial use in rheumatic and other diseases was likewise demonstrated by many workers.[3] ACTH, when injected into the body, exerts its effects by stimulating the patient's own adrenal glands to produce increased amounts of cortisone and Compound F. The latest evidence would indicate that Compound F is the main hormone produced by the adrenal gland under ACTH stimulation. The effectiveness of ACTH is dependent upon the functional ability of the adrenal gland to respond to stimulation, a patient with Addison's disease receiving no effect from ACTH administration.

The effects of cortisone and ACTH on the chemistry and metabolism of the body are profound and widespread. The physiologic effects of the adrenal hormones can be divided into three general groups: (1) The effect on salt and water balance, (2) the effect on carbohydrates, fats and proteins, and (3) the effects of an androgenic and anabolic nature. The physiologic effects of cortisone and Compound F are mainly those of the second group, although electrolytic and androgenic effects are also noted. ACTH administration results in an outpouring of all the adrenal steroids, and marked physiologic effects in all these groups are noted.

Changes in salt and water balance consist in the retention of sodium and water and the loss of potassium. These changes are associated with an elevation of the carbon dioxide combining power and a depression of the blood chloride. A hypochloremic, hypokalemic alkalosis similar to that noted in Cushing's syndrome may develop on prolonged administration of cortisone or ACTH. Electrolyte imbalance is more apt to develop on ACTH therapy because of the production of increased amounts of desoxycorticosterone and allied adrenal mineralocorticoids. Potassium chloride in 3-6 gm. amounts daily should be prescribed in cases receiving ACTH or cortisone in high dosage or for prolonged periods of time.

ACTH and cortisone increase liver glycogen and tend to elevate the blood sugar by interfering with the peripheral utilization of glucose and by increasing gluconeogenesis. This effect is rarely a problem in the clinical management of the normal patient on the steroids, although diabetic patients may require increased amounts of insulin. Linked with changes in carbohydrate metabolism are the decrease in the number of circulating eosinophiles and lymphocytes and the increase in the polymorphonuclear leucocytes. Eosinophile depression is a good index

to the physician of adrenal hormonal activity. Under ACTH and cortisone the eosinophile count becomes depressed, although it tends to rise again in patients receiving cortisone. Failure of the eosinophile count to drop on ACTH administration would mean that the adrenal is incapable of responding to the pituitary hormone. This forms the basis of the four-hour ACTH test of Doctor George W. Thorn.[4]

ACTH and cortisone increase the urinary excretion of uric acid, the physiologic basis for their use in gout.

The androgenic and anabolic effects of these hormones consist of hirsutism, acne, and retention of nitrogen, potassium, phosphorus and sodium chloride.

Certain other effects of the hormones may be mentioned briefly. ACTH and cortisone inhibit fibroblastic activity with resultant decrease in the formation of connective tissue.[5] This is noted in experimental animals, however, on dosage schedules greater than those commonly employed in clinical medicine. Wound healing is not delayed in patients on standard dosage therapy, and major surgery can be carried out successfully. In postoperative cases of hip anthroplasty, minimal fibrosis and scarring are desirable, and this antimesenchymal action of the drugs may prove of benefit. Effects on numerous enzyme systems have been described. Of particular import are changes in ascorbic acid, glutathione and Vitamin B metabolism. Further investigation must be carried out to determine the exact nature and the importance of the changes. Cortisone has been noted to improve rapidly the clinical appearance of tongues presenting the usual picture of Vitamin B deficiency.[6]

The exact mechanism of action of ACTH and cortisone is as yet unknown. They probably exert their beneficial effect at a cellular level, protecting cells against injurious agents whether the agent be mechanical, chemical or an antigen-antibody complex. The anti-allergic and anti-inflammatory properties of the drugs protecting individual cells form the basis of their use in many diverse conditions.

The chemical usefulness of ACTH and cortisone in many disease conditions has been well established. Diseases in which the drugs constitute substitution therapy and diseases in which inflammatory and allergic factors predominate are mainly benefited. A partial list of such conditions is contained in Table I.

Specific replacement therapy is provided by ACTH in panhypopituitarism and by cortisone in Addison's disease.[7] The discovery and availability of cortisone have been a distinct advance in the therapy of Addison's disease. 12 5 mg. of cortisone, plus 1-2 mg. of desoxycorticosterone (DOCA) daily, will successfully restore many Addisonians to a happy and useful life. Larger

amounts may be necessary in the management of Addisonian crisis. The experimental treatment of malignant hypertension with bilateral adrenalectomy is now possible because of the availability of cortisone.

Allergic and inflammatory diseases of the eye are greatly helped by the new steroids. Cortisone in a 1 to 5 saline dilution may be used locally.

A study program by the American Heart Association has been set up to evaluate the results of the new steroids on rheumatic fever. Because of the strong anti-inflammatory properties of the steroids, they are highly indicated in rheumatic fever to control the signs and symptoms of the acute disease[8] and possibly to prevent the development of rheumatic heart disease. A statistically significant series and an adequate follow-up period would be necessary to determine this latter point. Acute monocylic rheumatic fever responds more favorably than chronic rheumatic fever.

TABLE I—Clinical Uses of ACTH and Cortisone

Specific	Most Useful	Of Value
Panhyperpituitarism (ACTH)	Endocrine disease	Collagen disease
	Adrenal androgenic	Rheumatoid arthritis
	Hyperplasia (Cortisone)	Dermatomyositis
Addison's disease (Cortisone)	Functional hypoglycemia (ACTH)	Disseminated lupus
	Allergic disease	Periarteritis nodosa (early)
	Hay fever	Lung disease
	Angioneurotic edema	Silicosis
	Serum sickness states	Sarcoidosis
	Bronchial asthma	Pulmonary fibrosis
	Exfoliative dermatitis	Beryllium granulomatosis
	Collagen disease	Kidney disease
	Acute rheumatic fever	Nephrotic syndrome
	Inflammatory disease of the eye	Blood disease
		Acute leukemia
	Chronic gouty arthritis	Hemolytic anemias
		Intestinal disorders
		Ulcerative Colitis
		Regional enteritis
	Surgery	
	Severe burns	
	Pre- or postoperative debility, shock	

The treatment of choice in cases of acute gouty arthritis is still Colchicine followed by salicylates to tolerance for three consecutive days each week. Cortisone and ACTH, however, will provide more rapid relief than Colchicine. The steroids are particularly suited to cases of chronic gouty arthritis, refractory to other treatment. Colchicine must be resumed on discontinuing the hormones because of the tendency of the disease to exacerbate at that time.

The most widespread, and probably the most disappointing, use of the new drugs has been in cases of rheumatoid arthritis.

This crippler of seven million persons annually has long defied the therapeutics of clinicians and research workers. The steroids must be included in the long list of drugs which have failed to produce a cure. Courses of therapy utilizing the standard dosage, intermittent courses of therapy, and maintenance therapy have all proved disappointing. Courses utilizing high dosage therapy will have to be evaluated further but will probably also prove disappointing.[9] Although the drugs are almost completely effective in full dosage in alleviating the signs and symptoms of active inflammation, their discontinuance results in prompt return of disease activity and, in a few cases, exacerbation in disease activity. Despite this note of pessimism, the steroids are of benefit in the management of rheumatoid arthritis. Nothing heretofore has been capable of so quickly and so completely reversing this disease process. The use of the drugs should not be widespread and haphazard but limited, and with a definite purpose in mind. The indications for the drugs are probably twofold:

1. To halt an irreversibly downhill and potentially fatal course. 6%-10% of rheumatoid arthritis cases fall into this category.
2. To initiate a program of physiotherapy in patients who are bedridden with multiple joint involvement, physically and mentally unable to start on a therapeutic program without initial help.

The hormones must be used wisely and cautiously in rheumatoid arthritis, and in conjunction with rest, salicylates, if needed, physiotherapy, psychotherapy and orthopedic measures. Their unsupervised, indiscriminate use will result in harmful side effects and disappointment to patient and physician alike. Although clinical signs and symptoms of activity are suppressed by the steroids, there is evidence that pathologically the disease continues and anatomic progression may not be halted. Increased activity by patients relieved of their acute symptoms may produce further damage to weight bearing joints. The limitations of steroid therapy in rheumatoid arthritis cannot be overemphasized; the potentially life saving and rehabilitory properties not overlooked.

The use of the steroids in other collagen diseases has been disappointing because of the return of activity on discontinuing therapy. Their use as a life saving measure is certainly justified, and cases of prolonged remissions following their use have been noted. In disseminated lupus, and particularly in periarteritis nodosa, widespread vascular lesions may exist. Healing and obliteration of the involved vessels may result in secondary infraction and a therapeutic paradox. Low dosage maintenance therapy, after a course of standard dosage, may prolong life in seriously ill patients.

The anti-inflammatory properties of the steroids have resulted

in clinical improvement of sarcoidosis, Beryllium granulomatosis, silicosis and pulmonary fibrosis.[10,11] The disappearance of cellular infiltration and the inflammatory exudate results in improvement of alveolar gas exchange and pulmonary blood flow.

In acute and chronic glomerulonephritis the steroids are of little value but in the nephrotic syndrome[12] a beneficial diuresis may follow a short course of therapy with clinical improvement.

Steroid therapy in patients critically ill with acute leukemia[13] may result in immediate symptomatic improvement, although the prognosis remains unchanged. Idiopathic and symptomatic cases of hemolytic anemia[14] have been treated with the steroids, and prolonged remissions reported.

Remissions in cases of regional-enteritis and ulcerative colitis[15] may be secured by the use of ACTH and cortisone, and patients too ill for surgical consideration may be saved for surgery at a later date. Perforation of intestinal ulcers and hemorrhage may take place while the patient is on therapy, and must be anticipated.

The steroids are of clinical use in surgery. Severely burned patients who, on the basis of body area involvement, would not be expected to live have been saved by the use of the new hormones.[16] Debilitated patients may be readied for major surgery, and severe postoperative shock successfully treated.

Contraindications to the use of these drugs are listed in Table II. That the use of the steroids in severe diabetes, hypertension and congestive heart failure may be dangerous is apparent on consideration of their physiologic effects. The spread of active tuberculosis by ACTH and cortisone has been reported and their use in such cases is contraindicated. There is a possibility that inactive lesions may also flare. The American Trudeau Society is at present attempting to evaluate this problem completely by collecting and analyzing individual cases. Perforations of peptic ulcers occur on steroid therapy because of the increased production of pepsin and trypsin. The perforations may be difficult to diagnose in the early stages, delaying life saving surgery. Psychotic reactions have developed on steroid therapy. They are usually of brief duration, although prolonged periods of psychosis have been noted. Careful daily evaluation of the patient's mental status, with discontinuance of the drug on noting any mental aberration, will keep such episodes to a minimum. Patients with past histories of abnormal or profoundly neurotic tendencies should be treated with the utmost caution.

TABLE II. CONTRAINDICATIONS TO STEROID THERAPY

1. Severe diabetes
2. Hypertension
3. Congestive heart failure
4. Tuberculosis
5. Peptic ulcer
6. Mental disorders

One further note of caution is in order. The ability of the hormones to remove the symptoms of the disease, while not affecting the fundamental pathological process, can become a double edged sword in the case of infectious disease, and marked infections developing in patients on steroid therapy are proving a serious problem. Pneumonia and peritonitis may not be diagnosed until irreversible pathological changes have developed. A case[17] to illustrate this point is that of a forty year old patient under cortisone treatment for severe rheumatoid arthritis. Diagnosis of left lower lobe pneumonia, which ultimately proved fatal, was made only when the patient complained of being short of breath. She was in clinical shock with the usual signs of consolidation but no cough or fever attended the condition. Similar cases of masked infection are not uncommon.

With the discovery and availability of ACTH and cortisone, a new era commenced. Although material on the clinical usage of the drugs continues to mount daily, fundamental problems remain. Only with continued close cooperation on the part of the biochemist, the pathologist, the physiologist and the clinician will the final chapter be written.

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FUNGI, FACT OR FANCY FOR THE MEDICAL TECHNOLOGIST*

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The problem of growing and identifying pathogenic fungi is usually a difficult one for the medical technologist whose experience with these organisms is apt to be limited. The Manual of Clinical Mycology by Conant et al. is a most helpful reference.[1] Here may I say that because of time I shall limit this discussion to a few technical methods and to six organisms commonly encountered as contaminants which have little or no significance as etiological agents of disease. Other papers to be given at these meetings will deal with pathogenic fungi.

However, one bright spot does appear in this field. It is a good rule of thumb that if fungi grow rapidly they are usually saprophytic forms and have no pathological significance.

In general, the fungi grow best at room temperature. The simplest way to examine a slant is to lay the test tube flat on the microscope stage and use the low power objective to view the edge of the growth. If two test tubes are taped to the microscope stage to hold the tube to be examined in place, it facilitates such examinations. *It is not advisable to open such tubes in an ordinary laboratory.* Maybe some of you have done this, then regretted the action for a long time. One technician called and asked for help in identifying a fungus. When she brought in the specimen she saw a plasticine model of *Aspergillus* on my desk and immediately said, "That's what this looks like." We examined the growth with a hand lens and then, *in another laboratory,* opened the tube, and

*Read before ASMT, Swampscott, Mass., June, 1951.

prepared a wet mount. This is best done by placing a small bit of the aerial growth in a drop of lactophenol cotton blue, or other mounting fluid, and covering with a glass. In such a preparation of *Aspergillus* it is usually fairly easy to identify the typical conidiophores, with their sterigmata, and chains of spores. Usually, however, the spore chains are broken and only a few are left on the sterigmata. If such culture tubes are opened for examination under the ordinary conditions which we observe for bacterial cultures, the whole laboratory may become contaminated with spores. Often it becomes necessary to close the laboratory for cultural work until the whole place has been fumigated, or thoroughly washed several times, or until it has been repainted. Penicillin spores contaminating a medical school preparation room required repainting three times before culturing could be done there. Thorough spraying of such a contaminated room using 2% thymol in alcohol in a fine mist-like spray may be effective. The use of formalin and sodium permanganate as a disinfectant is good, but necessitates closing all windows, doors, and ventilators and leaving the room undisturbed for 24 hours.[5]

Well-slides have been used for cultural work. A new slide with a flat well at one end and a frosted surface at the other has been described by Littman of Tulane.[4] The slide, a No. 1, 18 mm cover glass and a small piece of absorbent cotton are placed in a Petri dish and sterilized. A small inoculum of the fungus to be studied is placed in the center of the well, leaving the slide in the Petri dish. Four to six drops of melted, sterile, potato dextrose agar (45-50 C) are dropped from a syringe into the lower half of the well, being careful to touch but not to submerge the inoculum. The cover glass is placed over most of the well with sterile forceps, but the top edge is left free to permit access of air. The preparation is sealed, except at the top edge, with hot sterile vaspar (70% hard paraffin and 30% petrolatum by weight) applied with a swab. The absorbent cotton is wet with 5 ml of sterile distilled water and the Petri dish is covered. The preparation is incubated at room temperature or at 30 C. Using this method about 30 preparations per hour can be set up. Pathogenic fungi can be isolated from clinical material with certainty in from 6-14 days. Sabouraud's dextrose agar is not used in the microcultures as it fails to promote spore formation. Johnson[2] recommends freshly prepared potato dextrose agar for the enhancement of spore formation.

Permanent mounts may be prepared from these microcultures. The vaspar is cut off with a razor blade. The cover glass is pried loose and carries with it a narrow line of fungus growth which shows all of the diagnostic structural forms. The cover glass is placed, growth side up, on the table and a small drop of lactophenol cotton blue added. An ordinary glass slide is touched to the coverslip and the latter picked up. After the preparation stands for 24 hours it is sealed with Permount or any other synthetic resin and the seal allowed to harden

for 48 hours. It may be covered with a second larger cover glass and kept for reference.

Aspergilli are probably the most frequent fungi which appear as contaminants. Some species of this genus are undoubtedly responsible for infections of the skin, lungs, and ears. It is a most discouraging experience to find this fungus overgrowing bacterial cultures. At first, within 24-48 hours, the colonies appear on the surface of the medium as a white, filamentous growth, but the color changes rapidly to green or black as the spores are produced. Microscopically Aspergilli are characterized by conidiophores which expand into large, bulb shaped vesicles at the end, covered with sterigmata which bear long chains of spores. One of the most difficult angles of fungus work is the multiplicity of terms. I will try to illustrate these as we go along.

The genus *Mucor* is characterized by the rapid growth of aerial mycelium which is at first white, but rapidly becomes dark gray. Growth may cover an entire plate within a few days. It appears as a lacy type of colony. The vegetative mycelium is non-septate and from this arise many sporangiophores of varying lengths which branch irregularly. Terminal sporangia are round and filled with elliptical spores. The sporangium walls are fragile and when ruptured leave a collarette at the base of the spherical columella.

The genus *Rhizopus* will grow rapidly under ordinary conditions giving rise to dense colonies which look like pieces of cotton, at first white and then dark gray. Stolons or runners connect groups (fascicles) of unbranched sporangiophores which arise where the runner touches the medium. Here a tuft of root-like hyphae or rhizoids is produced. The swollen tip of the sporangiophore, the columella, extends into the sporangium which is round, black, and filled with spores. The principle differences between Rhizopus and Mucor are the density of the colony, Rhizopus giving the appearance of being much thicker; and the fact that there are stolons or runners and rhizoids, and that the sporangiophores arise in bunches in Rhizopus.

The familiar genus *Penicillium* grows rapidly, the colony is white and then bluish-green and powdery as the spores appear on the aerial mycelium. Characteristically, the hyphae bear the "penicillus" or brush from which the genus is named. The conidiophores branch. At the ends of these branches metulae arise, topped by flask-shaped sterigmata which bear the unbranched chains of conidia. Species are differentiated by gross appearance, color, and texture, but all have the typical brush.

The genus *Candida* has long been known as Monilia and pathogenic conditions produced by *C. albicans* are still referred to as moniliasis. This genus is characterized by oval, budding, yeast-like cells producing both blastospores and pseudomycelium in tissues and

exudates, and in culture at room temperature and at 37 C. Species are frequently found in normal mouths, in the gastrointestinal tract, and as secondary contaminants. The organisms grow readily on all common media and produce white to cream colored, soft, moist to dull colonies with a yeast-like odor. Surface growth shows oval, budding cells, 2.5 to 4-6 μ in size. Submerged growth is the pseudomycelium which consists of elongate, undetached cells with clusters of blastospores distributed at points of constriction.

One highly differential point for *C. albicans* can be gained by slicing the suspected culture into corn meal agar plates. From a practical standpoint this species is the only one which will produce *chlamydospores* by changing the terminal cells of the pseudohyphae into thick-walled, round, resting spores. Occasional exceptions have been noted, but these would require detailed study.

A useful method for enhancing both the numbers of chlamydospores and the rapidity of their formation is to press a flamed cover glass over the line of streak where *C. albicans* has been cut into a corn meal agar plate.[3]

The genus *Altenaria* develops rapidly, the mycelium is close to the surface and the original gray color rapidly changes to black with a gray edge. The reverse of the colony is black. Aerial mycelium begins to appear in isolated areas on the colony, may be dull white or gray and eventually may cover the black sporulating mycelium. The conidia are termed muriform and are produced in chains from the ends of the conidiophores. They are dark brown and have transverse and longitudinal septations. A germ tube may be produced from any cell in the conidium. Each conidium has a pronounced dark spot at the point of attachment to the one immediately below, from which is budded. Spores are formed in acropetal succession and branching chains are often found.

If cultural work with fungi must be done in an ordinary laboratory, or if plates contaminated with fungi must be opened to fish the wanted bacterial growth, it would be wise to set up an inoculating box. This consists of a wooden frame or a wooden box of convenient size for the desk space with one side removed and the top replaced with a piece of window glass. The bottom can be covered with wet cheese cloth and the sides and back wet down thoroughly. Careful use of this gadget may avoid contaminating a whole laboratory.

The bibliography includes several standard books with a brief evaluation of their usefulness.

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PRESENT PLANS FOR THE COMMISSIONING OF CLINICAL LABORATORY OFFICERS*

PART I—COLONEL O. F. GORIUP

Department of the Army, Office of the Surgeon General, Washington, D. C.

PART II—MAJOR BEN C. LILES

Department of the Army Air Force, Office of the Surgeon General, Washington, D. C.

I have been asked by your society to meet with you this afternoon to tell you about our plans in the army for the commissioning of Clinical Laboratory Officers. I felt that before I went into our detailed plans that perhaps it was appropriate to give you a brief resume of the Army Medical Service Corps, its purpose and organization. The Army Medical Service Corps was organized under the provisions of public law 337, dated 4 August 1947. The establishment of this corps was an outgrowth of personal utilization lessons learned during World War II. During the period between World Wars I and II there were established in the medical department of the army three separate and distinct corps: the Sanitary Corps in 1919, the Medical Administrative Corps in 1920, and the Pharmacy Corps in 1943. The Medical Administrative Corps Act was amended in 1934 which established graduation from an accredited school of pharmacy as a minimum requirement for appointment in that corps. The Sanitary Corps did not enjoy regular army status, hence it was composed exclusively of officers in the reserve components. It consisted of personnel basically qualified in the medical sciences, engineering, and in the high levels of medical and supply management. The Medical Administrative Corps was designed initially to permit the commissioning, both in the regular army and reserve, of outstanding enlisted personnel as well as personnel from civil life.

The Pharmacy Corps was established as both a component of the regular army and the reserves. This corps was limited by law to a strength of seventy-two. Inasmuch as it was established in 1943 and since appointments in the regular army were curtailed during the war years, that corps never attained its authorized strength. In fact, the combined three corps had very few members on active duty, as well as on the reserve roster between

*Transcription of a talk given before ASMT, Swampscott, Mass., June, 1951.

World Wars I and II especially when viewed in the light of our present day arm. As a result of that situation the opening of hostilities in December of '41 found the medical department with a willfully inadequate supporting force for its Medical Corps. However, in true American tradition and in tempo with the rapid expansion of the armed forces, these corps were immensely increased through the direct commissioning of well qualified enlisted men as well as the direct appointment of outstanding civilians; through battle field appointments and the greatest bulk through the Medical Administrative Corps Officers Candidate Schools. Lack of substantial numbers of officers on active duty between World Wars I and II precluded the establishment of well ordered career plans for, as well as assimilation of experience data of utilization of this type of personnel. Prior to World War II and extending into the early phases of the war it was traditional for Medical Corps officers, who are doctors of medicine, to perform many types of duties which were time consuming and some only remotely connected with the actual practice of medicine. The personnel of the combined three corps clearly demonstrated that once present in sufficient numbers and permitted to assume many of these duties, could render a vitally needed service to the medical department. Upon cessation of hostilities, Major General Normal T. Kirk the then Surgeon General, requested that a corps be established in the army that would encompass all of the disciplines found in the Medical Administrative, Sanitary, and Pharmacy Corps, and that it be given regular army as well as reserve status. He further requested that the language of the law be so stated that it would permit of easy expansion as time and experience dictated. Subsequent to the usual Washington system of conference, bicker and compromise, Public Law 337 was passed by the Congress and the Medical Service Corps was officially established in August 1947. In order to maintain integrity of the various groups of the progenitor corps, the Medical Service Corps was organized in four sections. Provisions were also made to add such sections as the Secretary of the Army deemed necessary from time to time. This allowed for future expansion. The four current sections of the corps are the Pharmacy, Supply, and Administration sections in which are found the members of the former Pharmacy and Medical Administrative Corps. Broadly speaking this group is composd of pharmacists, economists, statisticians, individuals trained in all phases of administration and management such as business, personnel, office, and hospital. Others trained in law, education, purchasing and contracting, physical education as it relates to rehabilitation, etc. This is by far the largest group in the corps since they are utilized in the entire medical supply system, in hospitals, medical field units, on the staff of the army

surgeons, on the general staff, as well as in the Surgeon General's office. The above constitutes the bulk of the Surgeon General's responsibility. The Sanitary engineering section comprises that portion of the Sanitary Corps as it relates to the sanitary engineer. We procure that type of personnel from the general disciplines of civil and chemical as well as sanitary engineering. They are utilized as professional consultants and are generally assigned as staff members to a post and higher army headquarters. They are broadly concerned with environmental health, preventive medicine and of course with water and sewage disposal. Quite a few of these officers are currently engaged in research projects in fields of mutual interests to them and to the military establishment. The optometry section is composed of graduate licensed optometrists and as a group are new to the medical services. Incidentally, the name of the medical department has recently been changed to the Army Medical Service and should not be confused with the Army Medical Service Corps. Optometry officers of the optometry section are usually assigned to the eye services of our general hospitals and to the larger station hospitals. One such officer is currently engaged in research at the army environmental health laboratory located at Edgewood Arsenal, Maryland. The last, but not least, section is called the medical allied science section which is composed of personnel formerly found in the Sanitary Corps. In recent times several new disciplines have been added. Broadly, it is composed of bacteriologists, biochemists, serologists, physicists, mathematicians, hematologists, entomologists, clinical psychologists, psycophysiologists, clinical laboratory officers, psychiatric social workers, nutritionists, etc. These personnel are utilized throughout the professional services of the army medical system, on assignments that range all the way from routine procedures through fundamental basic research. Those in psychology and related fields are currently assigned to the psychiatric services of our medical installation such as general and station hospitals, army disciplinary barracks, and to the army medical service research laboratory at Fort Knox, Kentucky.

Entomologists are assigned to duties in both field and fixed installations where they contribute to the prevention and control of insects affecting the health, moral and comfort of the troops. They have made and are continuing to make, material contributions to research in their fields of interest.

Physicists, statisticians, industrial hygienists, toxicologists, as well as sanitary engineers, are generally assigned to the army environmental health laboratory. This is by no means a fixed assignment which can best be attested by the numbers of field trips to the Arctic which are constantly being made by these personnel in connection with their research activities.

Nutritionists are generally assigned to the nutritional laboratory at Chicago, where they are utilized in research, and to the office of the Surgeon of the major armies as well as to the Surgeon General's office.

The clinical laboratory groups comprise by far the greatest bulk of the medical allied sciences section of the Medical Service Corps. They are assigned to the clinical laboratories of all specialized hospitals as well as to the larger station hospitals. They comprise, almost exclusively, the entire Medical Service Corps complement in installations such as mobile field laboratories, appropriate divisions, sections, and branches of army medical research laboratories, the surgical research team at Brooke Army Medical Center, etc.

Experiences gained through the utilization of Service Corps officer personnel during and after World War II, dictated the need for well organized and orderly plans for a satisfying career in their chosen field commensurate with the needs of the service. As our procurement efforts added ever increasing numbers of well qualified Medical Service Corps officers to our rosters the need for such career patterns was accentuated if we were to make intelligent assignments, and exercise proper utilization of the human resources of the nation that was being made available to us. From a career stand point, officers in the laboratory groups are primarily bacteriologists and biochemists. For the most part officers of the regular establishment are either at the masters or doctorate level. Their career pattern leans heavily on further civilian institutional training and research. Since their number in the regular army is of necessity small, and since they are trained in only one of specialties found in the clinical laboratory group, it soon became apparent to us that a requirement existed for an individual with broad training in the clinical laboratory sciences who could be gainfully utilized for routine laboratory procedures, and better still as a supervisor of our clinical laboratories, especially in those smaller installations that did not warrant the assignment of a bacteriologist, serologist and biochemist. Furthermore, the assignment of that sort for individual would, to a great extent, free our more highly trained specialists for those procedures that require their training as well as for research. It was at that point that Colonel Gilmore, Chief of the Pathology and Allied Sciences Division, the Surgeon General's Office requested assistance in the procurement of clinical laboratory officers. During our staff studies on this problem our attention was invited to the fact that a certified medical technologist could well satisfy our requirements. Further studies and conferences with the leaders of your society, The American Society of Medical Technologists, revealed that an individual had to possess specific qualifications in order to be certified by your

Registry. That information was most gratifying to us. I might add, the Surgeon General does not presume to be accrediting agency of civilian institutions, of courses of study conducted thereat, nor does he presume to set the standards necessary for licensure or certification in any specialty. To that end he looks to recognized civilian groups such as yours to set the standards. I must confess that we had a few disturbing moments with the leaders of your society, upon learning from them that the membership of your society was composed predominantly of females. The Surgeon General has long recognized that the nation must look to its woman power in order to get us over the hump in any emergency. To that end he has proposed legislation that would provide for the commissioning of females in the four male corps of the medical service. It must be remembered that the medical, dental, veterinary and medical service corps are by law limited to males. Proposed legislation is still making the rounds in the defense establishment and it cannot be predicted at this time when it will be enacted, if ever. The two female corps of the medical service, the Army Nurse Corps, and the Women Medical Specialists Corps, are like-wise limited by law to females who are qualified as nurses, hospital dietitians, physical-therapists, and occupational-therapists. We were now faced with the prospect of potential procurement of a female certified medical technologist, and being prohibited administratively from commissioning her in any of the five corps of the medical service. It remained for one of our Medical Service Corps officers, who was a legal specialist in the Surgeon General's office, to ferret out sufficient authority in existing law which would permit the commissioning of females in all four male reserve corps of the medical service. Armed with that authority, together with information obtained from your society, the Surgeon General sought and received authority from the general staff to provide for their appointment in the reserve components. All procurement regulations were amended accordingly, and special regulation 140-105-6 dated 12 October 1950 now provides for the commissioning of females in the same fashion as males in all sections of the army medical reserve. More specifically paragraph 16E of the above cited special regulation sets forth the minimum qualification acceptable to the Department of the Army for the direct appointment of medical laboratory specialists and I quote, "For appointment in the grade of second lieutenant in the Medical Service Corps section of the reserve applicant must meet either of the following requirements: Possess a master's degree from a school or university acceptable to the department of the army in one of the specialties listed below. Or, possess a bachelor's degree from a school or university acceptable to the department of the army in one of the specialties listed below, and in

addition must have been certified as a clinical laboratory technologist or medical technologist by an organization acceptable to the Department of the Army and authorized to tender such certification. For appointment in grades of first lieutenant through colonel, for services in the medical service corps section, applicants must meet the requirements for second lieutenant, and must have had additional qualifying education and/or appropriate progressive experience to meet the requirements for the prospective grade specified. Appointmnt in grades of major and above, will not be made except in cases of highly qualified men and women of recognized ability such as individuals with professoral rank or those having outstanding scientific research accomplishments or exceptional supervisory ability. The specialties are bacteriology, biochemistry, medical parasitology, serology, toxicology, and medical technology. I would be remiss if I failed to point out that our needs are limited to those of you who are certified medical technologists rather than to those of you who are at the masters or doctorate level, and are limited in one of the clinical laboratory specialties. Our requirements are likewise predominantly limited to those of you who can otherwise qualify for the grade of second or first lieutenant. Direct appointments are made to satisfy our requirements for extended active duty, as well as to fill existing vacancies in the organized reserve troop program in civil life. At the moment our requirements for reserve troop program units have been fairly well met. To those of you who are interested in joining forces with us, I would advise you to contact the headquarters of the Army area in which you reside, requesting forms, etc., necessary to make application for a direct appointment in the Medical Service Corps United States Army Reserve. The headquarters of these armies are located at, and encompass the following states; Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York and New Jersey, with Headquarters of the First Army, Governors Island, New York. Those residing in Maryland, Delaware, Pennsylvania, Kentucky, Ohio, Virginia and West Virginia, should contact the Headquarters of the Second Army located at Fort George, Camp Mead, Maryland. Georgia, Alabama, Florida, Mississippi, North Carolina, South Carolina and Tennessee, the Headquarters of the Third Army, Fort McPherson, Georgia. Texas, Oklahoma, New Mexico, Louisiana and Arkansas, Headquarters of the Fourth Army, Fort Sam Houston, Texas. Illinois, Missouri, Indiana, Iowa, Kansas, Michigan, Wisconsin, Colorado, Minnesota, Nebraska, North Dakota, South Dakota and Wyoming, Headquarters of the Fifth Army, 1660 East Hyde Park Boulevard, Chicago 15, Illinois. California, Arizona, Idaho, Montana, Nevada, Oregon, Utah and Washington, the Headquarters of the Sixth Army, Presidio of San Francisco, California. If in doubt contact any

local reserve unit or recruiting stations to determine the location of your army area headquarters. Should you desire additional information, I would suggest that you address your inquiry to Department of the Army, Office of the Surgeon General, Attention Personnel Division, Washington 25, D. C. I thought that you might be interested to know the procedures you would follow subsequent to making application for an appointment. It should go somewhat as follows: You will be notified to report to some nearby military medical installation for a physical examination. You will also be required to meet a board of officers established in your military district who will attempt to evaluate your qualifications as an officer as distinct from a medical technologist. You will be required to take a biographical evaluation examination which will give you an opportunity to evaluate yourself to us. This is a simple test, nobody really flunks it, and it should in no way scare you away. All of the above findings plus a personal history statement, and your transcript of college credits contribute to a composite score that is evaluated in your army area headquarters. If found qualified as both a medical technologist, and a potential officer you are then nominated to our headquarters in Washington for appointment and assignment instructions. Your orders for extended active duty entitle you to a uniform allowance of $250.00, and travel pay to your first duty station. You will undoubtedly be ordered to the Medical Field Service School at San Antonio, Texas, to undergo the women officer's indoctrination course where you will be taught the difference between your left foot and your right foot. This is of one month's duration, and you will find that it will hold you in good stead for the rest of the time that you spend in the army. You will then be tagged with a military occupational specialty number; in your case MOS3314, Clinical Laboratory Officer. The job description reads as follows: Supervises and performs clinical laboratory procedures in hematology, bacteriology, serology, biochemistry, parasitology and other phases of diagnostic laboratory work. Instructs personnel in laboratory procedures, supervises preparation of reports, of tests and findings, maintains records, may serve as chief of a section in the hospital laboratory, must possess a bachelor's degree with specialization in the biological sciences, including chemistry from a school or university acceptable to the Surgeon General, and have had training or experience in clinical pathology acquired in the army at a hospital, university, or medical school, research agency, governmental health agency, or medical diagnostic laboratory acceptable to the Surgeon General. From then on you are on your own. Your pay and allowances, (privileges) and responsibilities are identical to those that accrue to any male officer of the Medical Service Corps of comparable grade and

qualifications. In conclusion, I should like to make it abundantly clear that we are not able to offer you regular army appointments. Any appointment at this time must, of necessity, be limited to reserve status only. We do, however, hope that you will avail yourselves of this opportunity to join with us so that together we can get the job done. Thank you very much.

Part II

The history of the Army Medical Service Corps which you have heard related, until 1949, so happens to be also the history of those of us who are now in the Air Force Medical Service Corps. On July 1, 1949, following approximately two years after the establishment of a separate department of the Air Force, the Air Force established its own medical service. As a result of that establishment, we too, have our own Medical Service Corps organized similarly to that of the Army. I shall not go into the details of the organization. I do not wish to repeat many of the things which Colonel Goriup has already mentioned. However, I would like to add that we are at the present time operating in the vicinity of ninety hospitals, Air Force Hospitals. Those hospitals are under the control of the Air Force Surgeon General. There are indications, as you can probably tell from the newspapers, that there will be a continuing expansion in all of the armed forces. Consequently, opportunities for the members of your profession do exist in the Air Force. Our criteria for appointment in the Air Force Medical Service Corps is also essentially the same as that for the army. The minor differences are negligible. We do have at the moment a limited need for additional clinical laboratory officers to operate and supervise the laboratories in our hospitals which range in size from approximately fifty beds on up to a thousand. Our current needs are primarily for individuals who have at least a master's degree or considerable experience following the bachelor's degree. For those of you who may be interested. When you return from this meeting if you wish to contact directly the office of the Surgeon General, United States Air Force, we will be happy to furnish anyone making such an inquiry with the appropriate forms, and any information which you may need to make an application. We too have a need for women in the Air Force. In the Medical Service Corps, the opportunities there are equal. There is one other point that I would like to bring up which may be of interest to those associated with you. Particularly, you who are in teaching positions. We have a program for those younger men and women who may be graduating this spring or in the near future, and who if male, may be draft eligible, or in

the case of the young women, if for patriotic or other reasons they have a desire to enter the air force. Those who may not meet all the qualifications for a commission may if they so desire submit a request to the Air Force Surgeon General for a grade determination in an airman status. I would like to emphasize that this particular plan is aimed only at those individuals who may not necessarily qualify for a commission. The advantage of this plan to the individual is that he or she may obtain a letter of authority to enlist at any air force or army recruiting station in a specific grade higher than that in which an individual normally enlists, and usually in the grade of corporal, possibly higher, depending upon the qualifications. Not only does it provide for enlistment in a higher grade, but it insures the individual that he or she will continue to work in his specialty. Upon enlistment the individual is tagged with a specialty serial number and will be definitely slated for duty at a medical installation. In a normal enlistment there is always the possibility that the individual may be assigned duties not commensurate with his past training, but under the plan that we propose for those individuals who are not eligible for a commission we do expect to give recognition to their training. I would like to once again express on behalf of the Surgeon General of the Air Force, appreciation for the opportunity to talk with you. We shall be most happy to discuss further and more in detail any questions that any of you may have. Thank you.

IT IS TOO LATE TO APPLY

For the AWARDS under the FULBRIGHT ACT (U. S. Grants under the auspices of the Department of State and Board of Foreign Scholarships for University Lecturing and Advanced Research), as the closing date for 1952 was April 15, 1952.*

However, if you are interested in graduate study abroad or in pursuing a directed program of studies at the pre-doctoral level, apply to your local Fulbright Program Advisers or directly to the Institute of International Education in New York City, before October, 1952. University Lecturing and Advanced Research in special Interim Programs: September, 1952-June, 1953, in Denmark, Iraq, Pakistan, and Japan. The regular 1953-54 Competition East Asia and the Pacific: Australia, February-December, 1953, New Zealand, March-December, 1953, Philippines, June, 1953-April, 1954, India, July, 1953-April, 1954, Pakistan, October, 1953-July, 1954, Burma, June, 1953-March, 1954, Thailand, May, 1953-March, 1954, and Japan, April, 1953-March, 1954. Application forms and information are obtainable from: Conference Board of Associated Research Councils Committee on International Exchange of Persons, 2101 Constitution Avenue, Washington 25, D. C.

*The announcements were received in the Executive Office too late for publication in the March-April AMERICAN JOURNAL OF MEDICAL TECHNOLOGY.

THE HUMAN BLOOD GROUPS: P. H. Andresen, M. D., Chief, Municipal Blood Bank, Bispebjerg Hospital. Formerly Chief, Serological Department, University Institute of Legal Medicine, Copenhagen, Denmark. 124 pages. 19 tables. Charles C. Thomas, Springfield, Illinois. March 1952. $3.75.

A useful addition to the laboratory library, this little volume omits the details covered in most of our references concerning technics for blood grouping and typing. Rather it outlines according to the chapter headings: "General Description of the Blood Group Properties" which gives the reactions according to agglutinating properties found in the M-N, P, and Rh Systems, as well as those of the A-B-O System. A second chapter is "The Heredity of the Blood Groups in Brief Outline." This latter has a clear outline in tabular form such definite information as the genotypes and possibilities according to the various agglutinating factors. This leads to "The Medico-Legal Utilization of the Blood Groups in Disputed Paternity Cases," the prime purpose of the book, making it of interest to the lawyer, as well as to the physician and medical technologist. The limitations as well as the possibilities of such determinations are described clearly, and are placed in their respective categories as to value. Finally, there is a brief description of the technics involved in applying the blood grouping technics to other body fluids in identification of their respective properties and differentiation thereby.

Rx FOR MEDICAL WRITING: Edwin P. Jordan, M. D., and Willard C. Shepard. 112 Pages. Appendix. 25 Illustrations. W. B. Saunders Company, Philadelphia, Penna. 1952. $2.50.

For any medical technologist wishing to venture forth in the field of writing a paper this book will prove of inestimable value. Although it is directed toward the physician, it applies to anyone writing in the medical field. The first chapter covers THE PRELIMINARIES, such as "Choice of Subject," "Planning the Study, Outlining, Evaluating the Audience," etc. In short, the directions given are clearly helpful and concisely given. A world of good advice is given, making a point of revising, revising the revision, and still more revising, in order to bring out the "meat" of the subject under discussion. Further details in regard to tables, illustrations, statistics, and references, will be of definite assistance to the writer. The Appendices consist of a table of proofreader's marks, together with details of common abbreviations and other information which would otherwise require several references.

TEXTBOOK OF CLINICAL PARASITOLOGY: 2nd Ed. David L. Belding, M. D., Professor of Bacteriology and Experimental Pathology, Emeritus, Boston University School of Medicine. 1139 pages. 242 illustrations. 43 tables. Appleton-Century-Crofts, Inc., New York, N. Y. 1952. $12.00

This is the first revision since the original publication of this textbook on parasitology in 1942, consequently this edition incorporates such new material as has been deveoped during and since World War II. Identification of similar parasites has been simplified by grouping those that are closely allied. Parasitic diseases are described with special emphasis on the pathology, diagnosis, treatment, and prevention. The abundance of tables and graphic representations facilitates identification and comparison of data. This volume should be in every laboratory library for constant reference in the field of parasitology. Especially vauable is that section which embodies the "Technical Methods for the Diagnosis and of Parasitic Infections." The Physician may also find this an excellent refernce book for the treatment of such infections.

EDITORIAL

THE INSIDE STORY

I'm a Medical Technologist—MT (ASCP)—just like you. I LIKE Medical Technologists. They're mighty fine people. They are honest. They have a keen sense of what is right and what is wrong. They're the sort of people who get the job done even if five p.m. comes entirely too soon, and if they have to stay until six or even later, they do it because a night's sleep comes much easier if there isn't a blood count left in the refrigerator. I've had that perfectly horrible feeling that accompanies the realization that there's a hole in the bottom of the test tube and all five ccs. of blood are right down on the floor—right before the eyes of the patient, too! I have a terrible habit; when on a "Postman's Holiday," I run a finger over the oil immersion lens of the nearest microscope. If it is "sticky," I pass "snap judgment" and wonder if the "house-keeping" is the same.

I've worked in serology, and in hematology, and I've "done time" in "urinalysis" and chemistry. I've been on "week-end duty" and I've relieved the "night technician." I've been on "night call," too. It's really not so bad. Every new, "fresh out of training" technologist should have at least a year's experience in a small hospital where there's a seven-day week, and 24-hour call. No joking—the experience is worth while—and though we may find it hard to believe at the time, as the years roll by (which they have a way of doing), we'll "think back on it" and say it was by no means the WORST year or so of our experience.

"I've "had my day" in a Public Health lab. and as a "Field Technician", examining thousands of slides for a malaria survey. Then there's the small lab where I've done everything but wash the test tubes, and I've done that, too, when the maid was "off." (Another theory of mine is that every "growing" technologist should have a "day" at washing glassware and polishing slides.) In research, where the end results seem so long in coming into focus, I've had the question of "is it is or is it ain't?"

All of which leads up to the point that Medical Technologists and Medical Technology are the "prime interest" of your Executive Secretary-Editor. If you'll refer to your March-April 1952 issue of the JOURNAL, you'll see that there are others who feel that Medical Technology is a "pretty important" part of the medical picture. Your state society (just as your local or district society) is YOU and what you make it (and them). So, then, is your national society, the American Society of Medical Technologists, just what YOU make it. Your Executive Office is the "Workshop." Here our every effort is bent toward coordinating the activities of our societies. We keep the records of the national society and have the responsibility of channeling requests and inquiries in the direction where they will be answered. Each member of ASMT is an individual. We are interested in you and your problems as a medical technologist, and we are interested in ASMT and OUR COLLECTIVE PROBLEMS. With the advantage here of the accumulation of widespread information (from you all over these United States and elsewhere), we try to give to each of you whatever specific answer you require.

The only means of general dissemination of information we have is through the pages of the AMERICAN JOURNAL OF MEDICAL TECHNOLOGY, the official organ of the American Society of Medical Technologists, and our NEWSLETTER. The convention Program Chairman is the person who is responsible for collecting the scientific articles which appear on the pages of the Journal through the year following his "term in office." The articles you have read in the Journal through the years have been the results of the efforts of those people who have organized the literary efforts of primarily scientific-minded "technicians" into "convention programs" and then passed those efforts on as finished articles to become reading matter for us as members of ASMT. The editor coordinates the material and sees that it eventually becomes "the Journal."

During the past few years the Journal articles you have read have been gathered by such program chairmen as Mrs. Mabel Miller of Colorado, Sister M. Alcuin Arens of Minnesota, Miss Mary Eichman of Pennsylvania, Miss Lucile Harris of Texas, and Miss Helen Madden of Massachusetts, and their committee members. For the next year, beginning with the July, 1952 issue, the articles you will read in your Journal will be those Miss Mary Nix of Oregon, with her committee, have gathered for the convention programs. Those of you who won't be attending the sessions in Portland will still have the advantage of reading what was told there.

More than this, we want **each of you** to feel the Journal is yours. Beside the national convention papers, we want you to share those you hear at your own local or state meetings with the rest of us. You may want to print those first in your own state publications. We can understand that, but won't you pick out some of those articles and send them to THE AMERICAN JOURNAL OF MEDICAL TECHNOLOGY so that ALL members of ASMT can read and profit by them? Let us make 1952-53 a year of "sharing" our knowledge and our advantages, one of unity, of making Medical Technologists and Medical Technology grow by each individual putting into his societies HIS share of the effort. R. M.

A SIMPLE SCREEN TEST FOR CANCER

ANNA M. SLICHER, MT (ASCP)

(Editor's Note: The microphotographs below and on the page following were received too late to include in the article published in the AMERICAN JOURNAL OF MEDICAL TECHNOLOGY, Volume 18, Number 1, January-February, 1952. As the author has had many requests for examples of the phenomenon described, we are herewith printing the photographs she submitted. The slides are from the collection of N. Philip Norman, M.D., New York City, N. Y.)

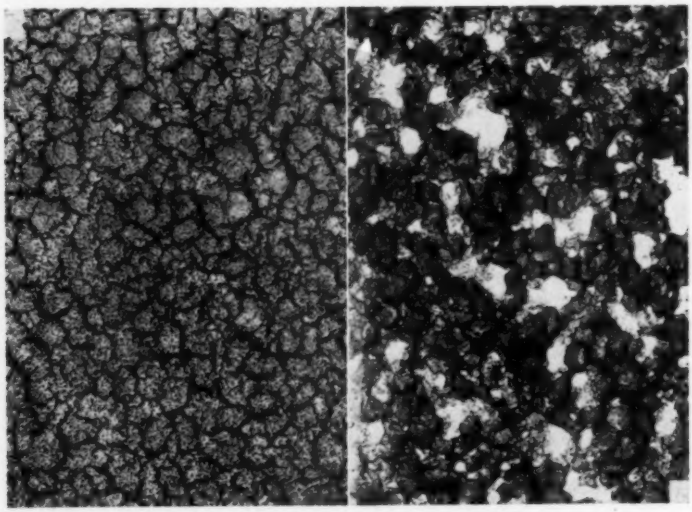

Figure I. Normal Clot Retraction Pattern. Figure II. Disseminated Arteriosclerosis.

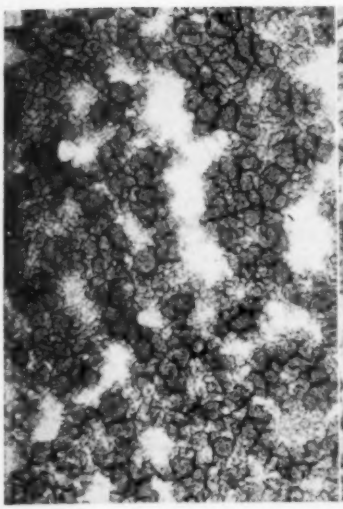

Figure III. Ulcerative Colitis.

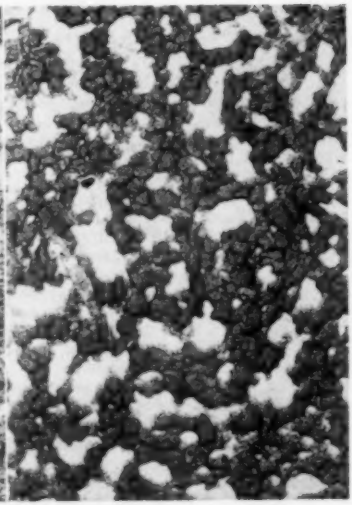

Figure IV. Pregnancy 4th Month.

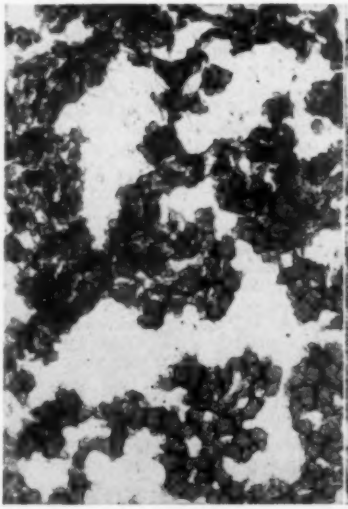

Figure V. Positive for Cancer.

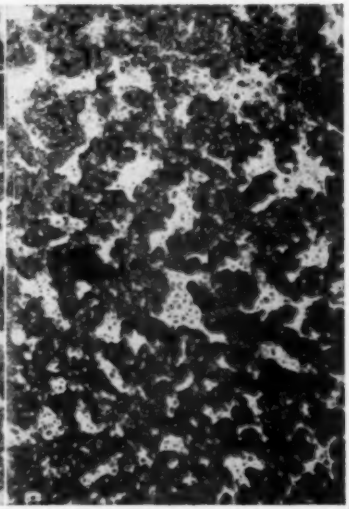

Figure VI. Active Tuberculosis

THE GAVEL

As the year draws to a close for 1951-1952, ASMT has many reasons to consider the forward steps in the accomplishments of its organization. To each and every one, the efforts of your directors and committees will bring a different response—perhaps favor, perhaps disfavor. The members, too, will feel that their work has brought complete satisfaction or the thought that a desire has not been attained. However, the balance may swing, all of us can look ahead to something for the years to come—else we would stop growing.

Our society has grown in its years of organization and with it comes the knowledge that we must bring our own personal growth to meet that development. A selfish ambition of individual or group must melt into the greater need of society future, and there can be no limit to our boundaries. The leaders of the years past looked to the future expansion, so leaders now will not be satisfied with slowing down. The desire to increase our membership, to add to our responsibilities for that membership is one phase. With that in mind, ASMT has requested representation on the Board of Approved Schools of Medical Technology from the American Society of Clinical Pathologists. This will be similar in plan to the membership on the Board of Registry, making our representation double that of now. Each new order puts greater courage in our hearts, and brings us closer to the needs of medical technology.

The problems of recruitment of medical technologists have been done with credit to our state societies and to the committee on vocational recruitment; but the shortage of medical technologists, M.T. (ASCP), has brought us to the attention of a national organization, the National Health Information Committee. We accepted an invitation to meet with this group in New York, February 20, 1952. (Through the work of the Public Relations Committee, ASMT was represented at the meeting of UNESCO in New York City in February also.) The reports of these sessions are elsewhere in this Journal. As this message is written, the Catholic Hospital Association has requested a greeting from ASMT to be given by one of our members attending that meeting in Cleveland, May 24, 1952. Your memory will tell you of the generous interview granted by the executive secretary of the American Hospital Association last October in Chicago. We are growing up and getting acquainted as we come of age.

You have already digested the March-April Journal with its list of proposed amendments, the list of nominations for officers and board members. You will have time to study and think over these important parts of our business to speed up the day of meeting.

The convention is near at hand and the desire to meet with all the other medical technologists should bring you to Portland for that long-awaited week. In this issue the program, the entertainment and plans are revealed, so pack your belongings—you can get along on very little luggage—and come! If it were possible to print all the names of members who have done a wonderful job this year in every phase of ASMT activity, we would have a complete roster. So count yourselves appreciated in this column for the honest, sincere and true support of your national society. Bring your problems, your criticism of things done and not done, your real selves to complete the picture of the national meeting of ASMT, June 22-26, 1952, in Portland, Oregon.

Since the time has come to say farewell for this year, there is little to do except lay my efforts before you, hoping the small part done will add its share to the sum of all. There is a new president who will greet you next issue, and to Sadie Cartwright go my best wishes for 1952-1953.

L. B. W.

ASMT CONVENTION

The Evergreen Playground of the Northwest and Portland, the City of Roses, welcome you with the well-known western hospitality to YOUR 20th Annual Convention, in Portland, Oregon, June 22-26, 1952. We have many excellent papers and social events planned for you. Top ASMT papers will be presented. Welcome to all MEDICAL TECHNOLOGISTS. SEE YOU IN JUNE.

MARY B. GODFREY, M.T. (ASCP)
General Chairman
1952 National Convention

CONVENTION ANNOUNCEMENTS

The Honorary Chairman for the 20th Annual Convention of ASMT will be Mr. Clyde Foley, Executive Secretary of the Oregon State Medical Society. Mr. Foley has given the Convention Committee much needed advice, and we would like to take this opportunity to publicly thank him.

Be sure to bring your copy of the March ASMT Journal. This issue contains the proposed amendments to the Constitution and By-Laws, and will be needed at the meeting.

The Registration and Credentials desk will be open at the Heathman Hotel during the following hours:

Saturday, June 21—1:00 P.M.-5.00 P.M.
Sunday, June 22—8:00 A.M.-10:00 P.M.

After this time Registration will be at the Masonic Temple. Tickets for all social events can also be obtained at the Registration booth. The Committee requests that all members have their ASMT membership cards ready for presentation. Hostesses will be on hand on Sunday to direct you to the Church of your choice. The Hospitality Committee wants each member and delegate to be sure to obtain the Hospitality Kit which will be available at the Registration Booth. These kits will contain much useful information about the convention and Portland. **Be sure to get yours when you register.**

Sunday afternoon there will be a tour of Portland and famed Multnomah Falls.

The Advisory Council Meeting will be held at 3:00 P.M. Sunday, in the Medical Dental Building Auditorium.

The Four Northwest Societies, Washington, Oregon, Montana, and Idaho, will be co-hostesses at the Sunday evening Reception, 7:00-9:00 P.M. in the Heathman Hotel. This will be a grand opportunity to meet and talk to the Candidates, as well as all the members.

Tuesday evening there will be a buffet supper at Timberline Lodge, on the slopes of Mt. Hood. Plan to come and be sure to bring your camera.

A Fashion Luncheon is planned for Monday noon at the Multnomah Hotel.

The Annual Banquet will be held in the Multnomah Hotel at 7:00 P.M. Convention Awards will be made.

Due to the reputation the Oregon rain has gained, you might include an umbrella in your luggage, but we hope it will not be needed.

Make your reservations for Hotel space today with Mrs. Elsa Thompson; see March Journal for details.

BE SURE TO HAVE YOUR ASMT MEMBERSHIP CARD WHEN YOU REGISTER FOR IDENTIFICATION FOR HOUSE OF DELEGATES.

ENTERTAINMENT ANNOUNCEMENT

To help you plan your convention budget, the entertainment committee announces the following costs for convention social events:

Fashion Luncheon	$2.75
Bus fare to Mt. Hood*	$2.00
Buffet supper at Timberline	$2.00
Annual Banquet	$7.50
Sister's trip to Dorchester*	$3.00
Sister's dinner at Dorchester	$2.00
Tour of Portland and Multnomah Falls*	$1.75

If there is anyone interested in an all-day trip to the Oregon Coast on the Friday following the Convention, please sign up at the Registration booth, and we will be very happy to arrange a trip. The cost of this trip will be dependent upon the number of interested people. We hope many members will take advantage of this opportunity to visit the Oregon Beaches and the Pacific Ocean.

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*Since the fares may change in the time between now and the convention we cannot absolutely guarantee these prices.

SPECIAL ATTRACTIONS FOR SISTERS

Plans have been made for special events for the Sisters who will be at the convention. We hope that you will really enjoy yourselves and remember the Northwestern Convention with pleasure.

We have told you about the special Mass to be held at the Grotto, The Sanctuary of Our Sorrowful Mother, on one of the mornings of the Convention week. This is one of the most beautiful natural shrines in the United States. It is situated in the midst of a forest of evergreens with paths and scenic walks leading to small shrines surrounding the Grotto.

There is going to be a trip to the Pacific Ocean with a dinner at Dorchester House on the beach. This trip will be the evening of the ASMT banquet, Wednesday, June 25th. This meeting is in response to a request for a chance for the sisters to have a meeting to discuss common interests.

The trips to Timberline Lodge and Multnomah Falls are both well worth experiencing and we know you will more than enjoy the breath-taking views to be seen of Oregon's scenic wonderland.

Housing for Sisters will be provided at St. Vincent's Hospital and Providence Hospital. Both institutions are fairly close to convention headquarters. St. Vincent's is about a ten-minute ride, and Providence is about a 20-minute ride.

We will see you at Convention and hope you will have a wonderful five days with us.

LAST CALL FOR SUN VALLEY

It's Sun Valley in '52, and this is the last call for reservations. If you haven't sent yours in, be sure to clip the coupon from the ad on another page of this issue, and rush it to Miss Ellen Skirmont, for the Sun Valley visit will be too good to miss.

In addition to the full day at Sun Valley, our train will travel through the scenic Columbia River Gorge during daylight hours. Over 175 miles of majestic beauty!

The Sun Valley stop will begin with a real western breakfast, followed by many things to see and do at the Sun Valley Lodge, Challenger Inn, and the various stores. Luncheon over, we will try that thrill of thrills, a ski lift ride up Baldy Mountain. Can you top this? You bet we can, for

the climax will be an outdoor barbecue dinner at quaint Trail Creek Cabin. Where can you get more for $11.50?

Put the "heat" on the boss, girls, for that June vacation and get your reservation slip in right away. Remember, you can travel on a modest budget using comfortable reclining seat coaches, or if you are a little more "flush," you can have your choice of Pullman sleeping car accommodations. By doubling up, three girls can occupy a drawing room, or two girls in a bedroom or compartment, thereby reducing the individual cost of these accommodations.

Don't delay—mail that reservation in TODAY.

THE AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS TWENTIETH ANNUAL CONVENTION

Headquarters
Masonic Temple Bldg.
Portland, Oregon
June 22, 23, 24, 25, and 26, 1952

PROGRAM

SUNDAY, JUNE 22

8:00 A.M. Registration—Lobby Heathman Hotel, 731 S. W. Salmon
3:00 P.M. Advisory Council Meeting—Medical Dental Bldg. Auditorium 833 S. W. 11
7:00-9:00 P.M. Reception—Heathman Hotel

MONDAY, JUNE 23

8:30 A.M. Formal Opening of Convention—Third Floor Auditorium, Masonic Temple, 1110 S. W. Park
Presiding—Miss Mary J. Nix, M.T. (ASCP)
Alternate—Miss Mary B. Godfrey, M.T. (ASCP)
Invocation—Most Reverend Edward D. Howard, D.D. Catholic Bishop of the Diocese of Portland in Oregon
National Anthem: Students from Marylhurst College, Marylhurst, Oregon
Salute to the Flag
Welcome—Hon. Dorothy McCullough Lee, Mayor, City of Portland; Representative of the Northwest Pathologists Society; Representative of the Oregon State Medical Society
Greetings—Miss Lavina B. White, M.T. (ASCP); President, American Society of Medical Technologists.
10:00 A.M. House of Delegates Meeting — Auditorium third floor, Masonic Temple
Presiding—Miss Lavina White, M.T. (ASCP)
Parliamentarian—Mr. David Fain
11:30 A.M. Recess
11:45 A.M. Formal Opening Exhibits—Sunken Ballroom, Masonic Temple
12:30 P.M. Fashion Luncheon—Multnomah Hotel
2:00 P.M. House of Delegates Re-Convenes
8:00 P.M. Public Relations Workshop—Medical Dental Bldg. Auditorium, 833 S. W. 11

TUESDAY, JUNE 24

8:30 A.M. Exhibits open

9:00 A.M. "Report of the Board of Registry of Medical Technologists" Lall G. Montgomery, M.D., Chairman, Registry of Medical Technologists, Muncie, Indiana

9:30 A.M. "The Effect of Adrenal Steroids on the Eosinophiles" Ronald D. T. Cape, B.Sc., M.B., M.R.C.P., Vancouver General Hospital, Vancouver, B.C., Canada

10:30 A.M. VISIT EXHIBITS

11:00 A.M. "Wonders of the Cell"
E. E. Osgood, M.D., Professor of Medicine, Head, Division of Experimental Medicine, University of Oregon Medical School, Portland, Oregon

12:00 M. Noon Recess

2:00 P.M. "Iron Metabolism"
Clement A. Finch, M.D., Associate Professor of Medicine, University of Washington Medical School, Seattle, Washington

3:00 P.M. VISIT EXHIBITS

3:30 P.M. "Animal Diseases and Human Welfare"
Karl Meyer, M.D., Director, Hooper Foundation, University of California Medical School, San Francisco, California

4:30 P.M. Board Buses for Mt. Hood and Timberline Lodge

WEDNESDAY, JUNE 25

8:30 A.M. Exhibits open

9:00 A.M. "Principles of Interpretation of Exfoliative Cytology" Warren C. Hunter, M.D., Professor of Pathology, Head of Department of Pathology, University of Oregon Medical School, Portland, Oregon

9:15 A.M. "Technique of Obtaining Material for Cytologic Study" Howard L. Richardson, M.D., Assistant Professor of Pathology, Department of Pathology, University of Oregon Medical School, Portland, Oregon

9:30 A.M. "Method of Fixation and Histochemical Technique" Captain James C. Beyer, Army Institute of Pathology, Washington, D. C.

9:45 A.M. "Decalcification Methods"
Miss Grace Dowling, Army Institute of Pathology, Washington, D. C.

10:00 A.M. "Celloidin Techniques"
Miss Eileen Seiver, Army Institute of Pathology, Washington, D. C.

10:15 A.M. "Special Stains"
Miss Mary Francis Gridley, M.T. (ASCP), Army Institute of Pathology, Washington, D. C.

10:30 A.M. VISIT EXHIBITS

11:00 A.M. "Hospital Associations and Medical Technologists" Charles U. Letourneau, M.D., Secretary, Council on Professional Practice, American Hospital Association

11:45 A.M. "The Relative Merits of Various 'Routines' for the Study of Anemias and Their Use in the Classification of Anemias," Maxwell M. Wintrobe, M.D., Ph.D., Professor and Head, College of Medicine, University of Utah, Salt Lake City, Utah

12:45 P.M. Noon Recess

2:00 P.M. "Antibiotic Sensitivities"
Frederick C. Fink, Ph.D., Coordinator Hospital Laboratory Service, Chas. Pfizer Company, Inc., Brooklyn, New York

3:00 P.M. VISIT EXHIBITS

3:30 P.M. "Experimental Studies of Immunity in Tularemia and Brucellosis" Carl L. Larson, M.D., Director, National Microbiological Institute, Rocky Mountain Laboratory, Hamilton, Montana

4:15 P.M. "Some Principles of Photoelectric Colorimeters" S. F. Crynes, M.D., Director, Physicians Medical Laboratory, Portland, Oregon

7:30 P.M. Annual Banquet—Grand Ballroom, Multnomah Hotel.

THURSDAY, JUNE 26

8:30 A.M. Exhibits open

9:00 A.M. "Calcium and Phosphorus Metabolism" Howard P. Lewis, M.D., Professor and Head of the Department of Medicine, University of Oregon Medical School, Portland, Oregon

9:45 A.M. "The Use of Isotopes in the Study of Metabolism" Edward S. West, Ph.D., Professor and Head, Department of Biochemistry, University of Oregon Medical School, Portland, Oregon

10:30 A.M. VISIT EXHIBITS

11:00 A.M. "Liver Function Tests"
Daniel A. Labby, M.D., Assistant Professor of Medicine, University of Oregon Medical School, Portland, Oregon

12:00 M. Noon Recess

1:30 P.M. "Antibiotic Therapy"
William M. M. Kirby, M.D., Associate Professor of Medicine, University of Washington Medical School, Seattle, Washington

2:30 P.M. "Our Recent National Survey of Schools of Medical Technology" O. O. Christianson, M.D., Member Board of Approved Schools of Medical Technology, American Medical Association, Director, Laboratory, St. Luke's Hospital, Spokane, Washington

3:00 P.M. Recess

3:30 P.M. "Phosphorus Metabolism in Disease"
Robert A. Aldrich, M.D., Ph.D., Assistant Professor of Pediatrics, University of Oregon Medical School, Portland, Oregon

4:15 P.M. "Behavior and Misbehavior of Laboratory Equipment"
Fred B. Claussen, B.S.E.E., Claussen Instrument Company, Portland, Oregon

8:00 P.M. Recruitment-Vocational Guidance Workshop—Medical Dental Bldg. Auditorium
Mrs. Ruth Drummond
Miss Ruth Feucht, M.T. (ASCP)

The time will be allotted later for the reading of the award papers. Plans are being made to have a continuous showing of Medical Films in the fields of Medical Technology.

TECHNICAL EXHIBITORS AND BOOTH DESCRIPTIONS

AMERICAN HOSPITAL SUPPLY CORPORATION

Evanston, Illinois

This exhibit will include Dade Typing and Grouping Serums, a Beckman Model B Spectrophotometer line, a Portable Laboratory Glassware Washer, "Tri-Lyne" Blood Diluting Pipettes, our new "Accupette" and improved designs of apparatus for clinical laboratories.

AMES COMPANY, INCORPORATED

Elkhart, Indiana

The Ames DIAGNOSTIC KIT will be featured. This small kit, measuring 3 x 9 inches, contains CLINITEST—a test for urine-sugar, BUMINTEST—a test for albumin, ACETEST—a test for acetone, and HEMATEST—a test for occult blood. No extra reagents, equipment, or accessories are needed. This kit is designed for the physician's office, small laboratory, hospital floor use, etc. The Ames representatives will be demonstrating these tests.

BECTON, DICKINSON AND COMPANY

Rutherford, New Jersey

Becton, Dickinson and Company are exhibiting B-D Vacutainers, Culture Bottles and the new B-D Disposable Blood Donor Sets.

CENTRAL SCIENTIFIC COMPANY OF CALIFORNIA

Santa Clara, California

CENCO exhibit features Specialties for use in Clinical Laboratories, Scientific Instruments, Scientific Apparatus and Laboratory Tools.

CERTIFIED BLOOD DONOR SERVICE

Jamaica 35, New York

The Certified Blood Donor exhibit is featuring blood grouping serum, products for testing for infectious mononucleosis, coagulation tubes to be used in connection with this test and Perma-Slides. Perma-Slides are made in many types, suitable for blood typing, microflocculation tests, serology and bacterial titration tests.

CORVEK MEDICAL EQUIPMENT COMPANY

Portland, Oregon

Corvek is showing Raytheon Manufacturing Company's modern "Radar" Diathermy, the Microtherm; Also, Sanborn Company's Direct-writing Electrocardiograph, the Viso-Cardiette, and their Metabulator, latest model Metabolism tester; Also, the A.D.C. Audiometer, manufactured by Audiometer Sales Corporation.

THE DENVER CHEMICAL COMPANY

New York 13, New York

Galatest powder for the instantaneous determination of urine sugar and Acetone Test (Denco) for the detection of acetone in urine will be exhibited. You are cordially invited to visit our booth for demonstration of these "spot tests" for sugar and acetone. Galatest powder and Acetone Test (Denco) offer advantages of accuracy, simplicity, and economy in routine urinalysis.

DIFCO LABORATORIES

Detroit 1, Michigan

The Difco exhibit for the Medical Technologists Convention will consist of a display of clinical laboratory reagents and standardized culture media and reagents for microbiological procedures. This will include media for the detection and primary isolation of pathogenic micro-organisms, together with differential media for their identification. Among these will be the media most commonly employed for culturing organisms associated with blood and respiratory and enteric infections, as well as fungus diseases.

Reagents for clinical laboratory procedures will include Bacto-Sensitivity Disks for the determination of the relative sensitivity of micro-organisms to antibiotics, Bacto-Penase for the inactivation of penicillin, antigens for the sero-diagnosis of syphilis, Bacto-Thromboplastin, Bacto-Cephalin Cholesterol Antigen, Bacto-Thymol Turbidity Reagent, and Phenolsulfonphthalein.

DON BAXTER, INCORPORATED

Glendale 1, California

DON BAXTER, INC., America's pioneer name in parenteral therapy now offers you two new solutions . . . **Kaladex** for treatment of potassium deficiency and **Dextrathyl** which provides 1300 calories per liter for high-calorie parenteral feeding. These like all of Baxter's complete line of intravenous solutions come to you in our exclusive **Vacoliter** container and closure which assure you of solutions that are sterile and pyrogen-free.

We invite you to visit our display booth for complete information regarding these and other important Baxter products.

HYLAND LABORATORIES, BIOLOGICALS

Los Angeles, California

HYLAND LABORITORIES (Los Angeles, Calif.) will exhibit its full line of blood diagnostic reagents, including Blood Grouping and Rh Typing Serums, Anti-Human Serum for the Coombs Test, AB Serum, Guinea Pig Complement. Of special interest to technologists working with crime laboratories will be Hyland's Anti-Human Precipitin Serum, Dried, for detection of human blood.

KIMBLE GLASS, DIVISION OF OWENS-ILLINOIS GLASS COMPANY

Toledo 1, Ohio

KIMBLE GLASS, Division of Owens-Illinois Glass Company, will exhibit a representative line of Kimble laboratory glassware, including volumetric and calibrated apparatus. Products bearing the well-known trademarks EXAX, NORMAX, and "K" brand will be included as well as Kimble white and yellow back thermometers with the new permanent filler.

MacGREGOR INSTRUMENT COMPANY

Needham, Massachusetts

You are invited to visit our exhibit in booth 31 where our representatives will give you the latest information on MacGregor Instrument Products.

MEINECKE AND COMPANY, INCORPORATED

New York 14, New York

On display and demonstration will be Haemo-Sol, the truly outstanding scientific preparation for the cleaning of scientific apparatus such as laboratory glassware, etc. In addition to its remarkable cleaning qualities,

Haemo-Sol is entirely free rinsing, leaving no film or residue to interfere with subsequent titrations. In addition, Haemo-Sol prevents any etched condition of glassware.

ORTHO PHARMACEUTICAL CORPORATION

Raritan, New Jersey

ORTHO cordially invites you to booth 23 where the complete line of Ortho diagnostic reagents will be on display. Featured will be Ortho Blood Typing Sera including Anti-Rh, Anti-Human, Anti-Hr and Blood Grouping Serum.

CHARLES PFIZER AND COMPANY, INCORPORATED

Brooklyn 6, New York

Terramycin, newest of the broad-spectrum antibiotics forms a dramatic central feature of the display of Chas. Pfizer & Co., Inc., Brooklyn, New York. The newest dosage forms of Terramycin are exhibited and indications for use are described.

SCHIEFFELIN AND COMPANY

New York 3, New York

Schieffelin & Co., will exhibit Solu-Plastin, a stable, standardized, thromboplastin solution for use in prothrombin determinations. Supplied with an equal volume of calcium chloride solution it offers substantial economy of time and material with accurate and reproducible results.

SCIENTIFIC SUPPLIES COMPANY

Seattle 4, Washington

Scientific Supplies Company of Seattle will display the latest optical and photomicrographic apparatus as well as instruments for absorption and emission spectrophotometry. Also the recent developments in mechanical and constant temperature devices for the clinical laboratory will be exhibited.

THE TECHNICON COMPANY

New York 51, New York

The Technicon Company invites you to visit our exhibit in booth No. 2 where the latest in Technicon Equipment will be shown.

BOOKS

Appleton-Century-Crofts, Incorporated, New York, New York. The Blakiston Company, Philadelphia, Pennsylvania. Harvard University Press, Cambridge Massachusetts. C. V. Mosby Company, St. Louis 3, Missouri. W. B. Saunders Company, Philadelphia, Pennsylvania. Charles C. Thomas Publisher, Springfield, Illinois.

BLOOD BANK PROGRAM HAS PARTICULAR APPEAL TO TECHNOLOGISTS

Each year attendance of technologists at annual meetings of the American Association of Blood Banks has increased. This year it is believed the program planned will be of even greater benefit. It is anticipated that if sufficient interest is indicated, a refresher course will be given during the meeting.

The American Association of Blood Banks was organized in November, 1947, in Dallas, Texas, at a Blood Bank Institute. Since that time an annual meeting has been held each year and the membership has more than doubled. Workers in this field are bound together by a community

of interests and spirit in spite of divergence in training, background and function. At annual meetings they find inspiration in meeting leaders in this field and participating in the programs presented. Further, members have the opportunity to learn, to exchange ideas, to meet co-workers and, in so doing, improve the service of their respective blood banks.

The technologist performs such a vital function in the field of blood banking that he finds membership in the association helpful and stimulating. Typical of the feeling among technologist members are these very significant comments received in the office of the secretary regarding benefits of membership: "Just attending the annual meeting is worth the membership fee."—M.T. (ASCP)) (North Dakota); "Opportunity for those seeking employment to advertise through the News Bulletin."—M.T. (ASCP) (Arizona); "The Association encourages local interest in blood banks."—M.T. (ASCP) (Wisconsin); "I've been able to keep up with the most recent developments in this field and all suggestions and information are invaluable."—M.T. (ASCP) (Minnesota); "The annual meeting is an excellent place to get up-to-date in the matter of blood banking."—M.T. (ASCP) (New Mexico).

Make your plans now to attend the 5th Annual Meeting of the American Association of Blood Banks—Hotel Schroeder—Milwaukee, Wisconsin—October 9th to 11th, 1952. For further information and membership brochure write: American Association of Blood Banks, Office of the Secretary, 3500 Gaston Avenue, Dallas, Texas.

UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANIZATION, THIRD ANNUAL CONFERENCE

New York City, N. Y., January 27-31, 1952

To the credit of our national society, UNESCO has invited ASMT to send three delegates to its annual conferences. This year ASMT was represented by Sr. Teresa Mary, O.S.F., Miss Joyce Goldberg, and Sr. M. Clare, O.S.F., of New York City.

The sessions most pertinent to medical technology were those of the WORLD HEALTH ORGANIZATION. We attended the WHO workshops, and from WHO we bring you a message. Before delivering the message, however, we feel that some of you would like to know where WHO fits into the scheme of the United Nations.

Many citizens think of the UN solely as a political body. To do so is to think of UN in its worst, or at least, not in its best light. It is to rob UN of credit due it for its more successful undertakings, e.g. their achievements in world health. The UN is an international organization dedicated to . . . "maintain international peace and security, to develop friendly relations among nations . . ." UN is divided into six main Councils, such as the familiar Security Council. Each council is divided into Commissions and Committees, such as the Commission on Human Rights. In addition, specialized agencies are formed by intergovernmental agreement as necessities arise. UNESCO and WHO are two such specialized agencies, operating under the Economic and Social Council.

The WORLD HEALTH ORGANIZATION is dedicated to bringing health internationally . . . "health, as a state of complete physical, mental or social well-being, and not merely the absence of disease and infirmity." WHO's program is advisory and technical. Deliberately intending not to pauperize member nations, medically speaking, WHO seeks to educate each community to solve its own problems. WHO educates by publishing methods and training local personnel in the control of infectious and venereal diseases, maternal and child care, etc. WHO advises governments on the best use of their natural resources. Its technical program

includes standardization of biologicals; unification of pharmacopoeias; broadcasting epidemiological data to trans-oceanic ships and planes. It supplies specialists on request in the fields of nutrition, civil engineering for sanitation, etc. In brief, its success has been phenomenal.

Now the message WHO sends you is this. Because of the improved travel facilities, it is possible to transmit plague into the United States in twenty-four hours! Hence, there is an intimate relationship between the health of the rest of the world and the health of American citizens. WHO, therefore, asks you to seek a better understanding of its aims, its problems, its program. WHO seeks your cooperation in the formation of a NATIONAL CITIZENS COMMITTEE FOR W.H.O. which is being sponsored by the National Health Council.

It is evident that as loyal Americans we cannot endorse all of UN's policies, e.g. the world government idea. Nor, as scientifically minded workers can we accept their false approach and conclusions in regard to the history of mankind. Yet, we may not reject the whole because of that part. It has been ASMT's policy to support UNESCO. Now, WHO asks you individually and as an ASMT member to lend your cooperation to world health because . . . "the dignity of the human being, and the brotherhood of mankind . . ."

Finally, we remind you that any cooperation you render, large or small, if done for the sake of the "Brotherhood of Man" will be generously rewarded by the Fatherhood of God, whence the Brotherhood and dignity of man arises.

|S| Sister M. Clare, O.S.F.

HEALTH INFORMATION FOUNDATION MEETING, HOTEL BILTMORE, NEW YORK CITY, FEBRUARY 20, 1952

The group gathered with many cheery greetings, as most of those attending this meeting have executive offices in Chicago and New York, and knew each other quite well. Mr. Kenneth Williamson, Vice-President and Executive Secretary of the HIF, conducted the meeting with the same air of friendliness, which set the tone for an entire day of facts and figures, punctuated by time out for a delightful luncheon served by the HIF, and for a few moments of conversation both relaxing and stimulating.

The organizations represented were: American Association of Medical Record Librarians, American Association of Medical Social Workers, American Dietitic Association, American Hospital Associaton, American Medical Association, American Occupational Therapy Association, American Physical Therapy Association, American Society of X-Ray Technicians, American Society of Medical Technologists, Committee on Careers in Nursing, Health Information Foundation.

After each attending member had introduced himself and the organization he represented, Mr. Williamson briefed the group on the HIF. The Foundation is financed by recurrent subscription support of drug, chemical and pharmaceutical houses and is an independent and non-profit foundation. This commendable group of citizens, guarding the nation's welfare, have recognized the shortage of well-trained health personnel as a danger to the nation's health.

F. H. Arestad, M.D., of the Council on Medical Education and Hospitals, expressed the concern and deep interest of the AMA in the subject. Since all of us represented AMA sponsored groups, Dr. Arestad showed how personnel shortages in one group are relative to another. All of us are drawing from the same pool of high school graduates who might be interested in advance education in the health fields.

Mr. George Bugbee, Executive Director of the American Hospital Association, presented the results of 3400 replies to a questionnaire sent to 6000 hospitals. Supplemented by the reports to each member group present, the following figures were reached, based on the soundest estimates that could be obtained.

	Current Vacancies in Hospitals	Personnel Immediately Needed Outside Hospitals	Additional Personnel Needed in Hospitals in Nex 5 Years	Additional Personnel Needed Outside Hospitals in Next 5 Years	Total
Dietitians	3,334	6,668	5,392	10,784	26,178
Medical Technologists	3,757	7,474	10,528	21,056	42,795
Med. Record Librarians	2,145	2,545	3,078	4,278	12,046
Med. Soc. Serv. Workers	2,280	248	3,507	380	6,415
Occupational Therapists	2,265	2,465	2,897	3,897	11,524
Physical Therapists	1,940	2,522	3,323	4,984	12,796
Practical Nurses	29,000	58,198	41,833	83,666	212,796
X-Ray Technicians	2,127	3,000	6,422	6,000	17,549
Nurses	50,000	.....	.....	.....	50,000
	96,927	83,120	76,980	135,045	392,072

Dietitians and Medical Record Librarians figures may be too high. Medical Technologists, Occupational Therapy, and Physical Therapy figures just right.

The established shortage pictured here and the potential shortage five years hence needs the utmost guidance and recruitment know-how possible.

Mr. Williamson and Mr. Liebert of the HIF, then outlined a one-year program in cooperation with the National Advertising Council, whose purpose would be to interest young people in a health field career. In collaboration with the American Hospital Association, and using the hospital as the center of community health, each group represented would be given recruitment advertising, financed by HIF. The public health field would also be brought to the attention of the public, with the whole project under a top-flight group of leading citizens and a technical advisory committee. With this national back-drop of advertising, the hope was expressed for the redoubled effort of each state's local participation, and perhaps a small financial project of each national organization to be tied in with this overall program.

The enthusiasm with which the group met this is summed up in the following: "It is the individual opinion of those represented at the meeting that a nation-wide program which would recruit needed personnel in the various fields, undertaken under the sponsorship of Health Information Foundation, would appear to be desirable and worthwhile."

Each of us indicated a desire to present this program to our organizations for an official endorsement of an overall recruitment program as outlined, which Dr. Arestad pointed out would correlate the whole health field without independent groups in competition with each other.

Mr. Williamson expressed his gratification at all the groups represented, and I, as an ASMT member, thank him for this rare opportunity which HIF has given our organization.

/s/ MRS. ELINOR JUDD, MT (ASCP)
Board of Directors, ASMT